



THE
NATURALIST:

A
MONTHLY JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND

EDITED, BY

THOS. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.(Scot.).

CURATOR OF THE MUNICIPAL MUSEUMS, HULL.

HON. MEMBER OF THE YORKSHIRE NATURALISTS' UNION; THE SPALDING GENTLEMEN'S SOCIETY; THE DONCASTER SCIENTIFIC SOCIETY; THE SELBY SCIENTIFIC SOCIETY.

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JOHN W. TAYLOR M.Sc.

RILEY FORTUNE, F.Z.S.

1921.

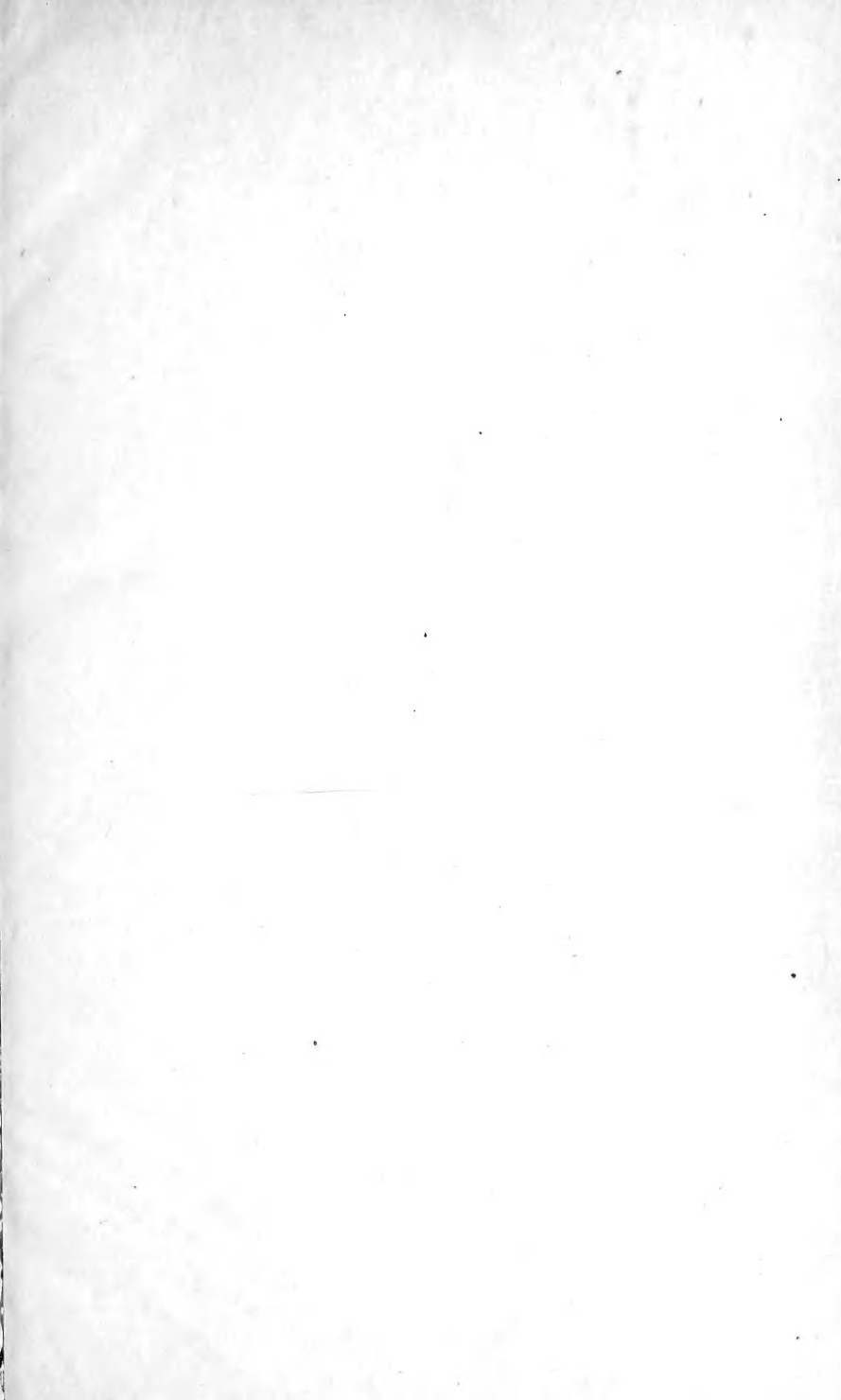


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YORKSHIRE NATURALISTS' UNION.

COMMITTEE OF SUGGESTIONS.

A Meeting of the above Committee and all others interested in Peat Investigation will be held in the Geological Department, Leeds University (De Grey Road), on **Wednesday, January 12th, at 7-30 p.m.**

Dr. FORSYTH will present his report on Bibliography, and the library question will be discussed.

Mr. W. H. PEARSALL will read a paper on "The Significance of Buried Trees in Peat," inviting comments.

Suggestions for future work will be welcomed.

CHRIS A. CHEETHAM.

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THE NATURALIST

FOR 1921.

NOTES AND COMMENTS.

SUBSCRIPTION TO THE Y.N.U.

In order to meet the greatly increased cost of paper, printing, etc., principally in connexion with its official organ, *The Naturalist*, it was unanimously resolved at the Annual Meeting of the General Committee held at Bradford on December 4th, that the subscription for membership of the Union should be increased from 12/6 to 15/- per annum, and that the qualification for Life Membership should be a donation of not less than eleven guineas; these increased rates of subscription to commence as from 1st January, 1921.

MR. H. H. CORBETT.

The Zoological Section of the Yorkshire Naturalists' Union nominated one of its number, Mr. H. H. Corbett, of Doncaster, as President of the Union for 1921, and this nomination was unanimously confirmed at the Annual Meeting held at Bradford on December 4th. On this occasion the Union honours one of its hard-working members, who has associated himself with Yorkshire natural history for a considerable number of years. The Doncaster Scientific Society owes its present successful condition largely to the energy of Mr. Corbett, who for a considerable period has helped in the capacity of President, Secretary, or in other ways. It is largely due to his efforts that the Doncaster Corporation, having purchased the Beechfield Estate, devoted the house to the purpose of a Museum and Art Gallery some years ago. For some years he acted in the capacity of Hon. Curator, and ever since its foundation he has taken a keen interest in the Museum and its work. Mr. Corbett is perhaps specially interested in Entomology, although he is a keen student in Ornithology and Botany, in fact he may be taken as a typical 'all-round' Yorkshire Field Naturalist. He has served on many of the Committees of the Yorkshire Naturalists' Union, and is a frequent contributor to this journal.

UNVEILING A MEMORIAL.

The annual monument to a certain man's marvellous memory (*i.e.* the volume of *Proceedings of the Prehistoric Society of East Anglia*) has recently appeared, in which we learn with irritating frequency of 'the author's researches.'

Instead of telling us plainly that 'I picked up a flint on the shore,' it is 'the present author's researches on the beach, in the presence of,' and so on. Even Prof. Sollas, following Sir Ray Lankester and Prof. Marr, now worships at the same shrine, and with reverent and respectful humility, tells us that this man picked a flint from a deposit *with his own hands* ! Is Prof. Sollas in the habit of picking things up with anybody else's hands, or does he pick flints out of strata with his toes or teeth? The 'author' has been to Mundesley, and temporarily all the wonders of the prehistoric world are switched on there for his edification. But he cannot give a plain account of the marvels of Mundesley without tacking on to it the stereotyped story of the succession of the flints at Ipswich, which we have seen over and over again in almost every scientific magazine in the country, with the exception, perhaps, of *The Naturalist*.

THE CONTENTS.

Otherwise, the volume is entertaining. Certainly the large crude school-boy sketches which once so lavishly adorned a certain author's rippling murmurs have disappeared and given place to decent sketches, but dozens of the illustrations are of quite common flints, and neither the flints themselves nor the illustrations in many cases are worth the cost of the blocks. Yet the subscription (a few years ago 2'6, then 5/-) is to be raised to 10/- in order to 'keep up the standard of the report.' Personally one would rather be without scores of these unnecessary illustrations, and save the second five shillings. There are, however, many valuable papers in the present part (Vol. III., pt. 2). These include 'Man and the Ice Age,' Presidential Address, by Prof. J. E. Marr ; 'Windmill Hill, Avebury, and Grime's Graves : Cores and Choppers,' by H. G. O. Kendall ; 'Implements from the Glacial Deposits of North Norfolk,' by J. Cox ; 'A Romano-British Site at Santon,' by W. G. Clarke ; 'Implements from Beer Head, South-east Devon,' by J. A. Powell ; 'A Bronze Shield from Sutton, Norfolk,' by R. Gurney ; 'The Stoke Bone-Bed, Ipswich,' by N. F. Layard ; 'A Series of Humanly-fashioned Flints from Mundesley,' by J. R. Moir ; 'A New Celt-making Floor at Grime's Graves,' by D. Richardson ; Note on the Paper by Mr. F. N. Haward on 'The Origin of the Rostro-Carinate Industry,' by A. S. Barnes ; 'A Flaked Flint from the Red Crag,' by Prof. W. J. Sollas ; 'Some Flat-based Celts from Kent and Dorset,' by H. Dewey ; 'The Evidence of South Yorks. Surface Implements relative to Classification and Dating,' by A. L. Armstrong ; 'Grime's Graves : Floors 47 to 59,' by H. G. O. Kendall ; 'Classification of Burins or Gravers,' also 'Pleistocene Deposits in England and the Continental Chronology,' by M. C. Burkitt.

PINE MARTEN IN EAST YORKSHIRE.

W. H. ST. QUINTIN, M.B.O.U., F.Z.S.

I WISH to record another of the strange sporadic occurrences of the Pine Marten, far from its nearest recognized habitat. About the middle of last May, George Allison, Mrs. Wickham Boynton's keeper at Barmston, six miles south of Bridlington, noticed the 'work' of some animal with which he was not familiar. Young rabbits were found killed, and their remains suggested a prowling cat. But seven or eight hares and leverets were found dead with peculiar injuries—a wound had been opened, in each case, behind the shoulder, from which the blood had been sucked. My friend, the Rev. Edmond Owen, a well-known Welsh naturalist, says that, when sometimes a young lamb is found with such a wound, it is recognised at once as the work of a 'Boda' (Marten). Traps were set, as for a cat, but with no result. In the end the animal was caught in a tunnel dug through a bank, in which a trap had been inserted, unbaited. On the 1st June, the Marten was found caught by a fore-leg, and dead. It was reported to me; but it had been sent off at once to the stuffer, and has only lately been returned. It is a male, and, from its teeth, apparently a young one, though full-grown. Its length, in the flesh, was given me as 32 inches. Mr. J. G. Millais, in his fine work, 'The Mammals of Great Britain and Ireland' (1905), gives the measurements of various British and Irish Martens, one of which, a Scotch one, and a male, also measured 32 inches in extreme length, the tail being 12 inches, with a weight of 3 lb. 2 ozs. (The largest specimen mentioned by Mr. Millais measured 35 inches.)

Unfortunately, as one would expect in the summer season, the animal was 'coating' badly, the forearms and thighs being covered with short, very dark brown, new hair; while much of the old pelt remains on the back and rump. The ears are thinly covered, and the brush very shabby. The breast spot is decidedly white, but this is, no doubt, due to the fading of the old hair. (The Beech Marten (*M. foina*), in which the throat and chest are pure white, is not a member of the British Fauna.)

Mr. Millais mentions a Marten which was trapped in February, 1900, at Swainby-in-Cleveland. I have no note of any more recent record for Yorkshire.

Can it be that the Cleveland occurrence indicates the route by which the animal under notice may have reached the East Riding? If it wandered down Teesdale, from Westmorland, to Cleveland, and thence through the moors by Newton Dale, it might not have had much more than some twenty miles to complete its journey to Barmston, and that

through the sparsely populated wold district, and perhaps at a season when the farm crops were growing fast, and affording cover.

This is the same animal that was discussed at the meeting of the Vertebrate Section of the Union at Leeds, on October 23rd, and there described as a 'large escaped Ferret'. But, anyone familiar with the Pine Marten should have no difficulty in recognising a specimen, whose superior size, larger ears, longer legs, and longer and more bushy tail sufficiently distinguish it from the Polecat, or from the latter's domesticated form, the Ferret.

—: o :—

GEOLOGY.

Glacial Erratics at Scarborough.—During excavations in the Boulder Clay forming part of the Cliff of the South Bay, at Scarborough, made in connection with a building for entertainments, no fewer than nine large Shap Granite Boulders, and four of Carboniferous Limestone, were excavated. The largest three of the Shap Granite Boulders measure 14 ft. 7 ins., 12 ft. 4 ins., and 9 ft. 3 ins. in girth, respectively, and from 2 ft. 11 ins. to 3 ft. in height.—D. W. BEVAN, Scarborough.

Permian Marls at Ripon.—Drainage excavations, in early 1915, at Ripon South Camp shewed that red and grey marls, with occasional thin limestones, occur close to the surface at about the 150 ft. contour, and 200-300 yards west of the Harrogate Road. Southward towards the Magnesian Limestone quarry at Quarry Moor (rather less than a quarter of a mile away) boulder clays intervene, so that the junction of the marls and the massive limestone was not seen, but presumably the marls are of either Upper Permian or Triassic age.—W. S. BISAT, North Ferriby.

Schizodus (obscurus or truncatus?) near Doncaster.—A small *Schizodus* is well known from the shell bed at the summit of the Upper Magnesian Limestone. At a quarry on the Doncaster-Tickhill road, one mile south of Wilsick (close to Narrow Lane), it occurs in fair numbers at this horizon, in loose blocks in the subsoil at the north-west corner of the quarry. The peculiarity about it in this exposure is that *all* the specimens are preserved with the two valves outspread, and that quantities of what is presumably an algal growth cover the bedding planes at the same horizon. The algal growth is known elsewhere in the Upper Magnesian Limestone, but not in such quantities as occur at this quarry. Specimens are in the Doncaster Museum.—W. S. BISAT, North Ferriby.

THE CONGLOMERATES UNDERLYING THE CARBONIFEROUS LIMESTONE IN THE N.W. OF ENGLAND.

J. A. BUTTERFIELD, M.SC., F.G.S.

(Continued from *The Naturalist* for 1920, page 284).

II.—THE TEBAY AREA.

In a previous paper,* the distribution of the above conglomerates (long known as the Basement Conglomerates) in the Sedbergh Area was outlined, in a general way, and it was stated that in Nor Gill, near Sedbergh, there appeared to be evidence of a transition from the coarse red conglomerates into the Lower Limestone Shales. It is intended to give here a similar account of the general distribution round Tebay, and much clearer evidence of that transition. In the Sedbergh area the deposits consist of red conglomerates mainly, with a few interbedded red sandstones; but in the area under consideration there is a very different constitution, the red sandstones covering a much larger area than the red conglomerates, and a series of light green conglomerates and sandstones appearing which are quite absent in the Sedbergh area. Probably none of the deposits at Tebay are so old as the coarse red conglomerates of the bed of the Rawthey at Sedbergh.

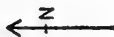
The area is contained in the three Ordnance Survey quarter sheets (6 in. to mile), numbers 21 S.E., 28 N.E., and 29 N.W. The accompanying sketch map gives a general idea of the geological features, though, for the sake of clearness, all deposits of alluvium have been left off. The writer must accept sole responsibility for the ideas contained in it, and it is quite possible that it may require considerable amendment as more field work is done. Reference should also be made to the one-inch geological map of the district.

From the one-inch map it will be seen that near to Penrith the conglomerates occupy a fairly large area around the Mell Fells,† but from the south-east corner of this area southward there is only a very narrow strip, varying in width up to about half-a-mile, which skirts the outcrop of the Carboniferous Limestone in the form of a crescent, curving round eastwards for a short distance when it reaches Tebay. The portion contained in the sketch-map is the southern portion of this curve, extending about three miles east and three miles north-west of Tebay village. This narrow strip of conglomer-

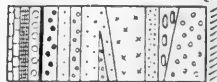
* See *The Naturalist*, August, 1920, p. 249, and Sept., 1920, p. 281.

† 'Mell Fell Conglomerate,' Green. *Proc. Geol. Assoc.*, Vol. XXIX.,

BASEMENT CONGLOMERATE OF TEBAY.



S.B. STAKELEY BECK.
M.G. MICKLEGILL BECK.
H.G. HOLLIN GILL
ESK.B. ESKEW BECK.
B.B. BLIND BECK.
C.B. CHAPEL BECK.
R.G. REDGILL BECK.
E.B. ELLERGILL BECK.
L.G. LANGDALE BECK.



CARBONIFEROUS LIMESTONE.
GREEN BROWN MUDSTONE.
SHALE CONGLOMERATE.
GREY SANDSTONE AND FINE CONGLOMERATE.
RED SANDSTONE AND CONGLOMERATE.
PURPLE-GREEN SANDSTONES.
LIGHT GREEN AND GREY SANDSTONES.
GREEN CONGLOMERATE.
RED CONGLOMERATE.
SILURIAN FLOOR.

OLD TEBAY

TEBAY.

0 1/2 1 MILE

ates dips underneath the Carboniferous Limestone to the north and north-east at a similar angle to that of the limestone itself, and rests unconformably on the Upper Silurian rocks, etc., to the south and south-west. On the one-inch map a narrow strip marked as Lower Limestone Shales is shown parallel with this strip of conglomerates, and this at once suggests a passage from the Conglomerate Series into the Carboniferous Limestone, which passage is borne out by the field evidence. In these notes the writer has coupled together the beds marked on the one-inch geological map as Basement Conglomerates, and Lower Limestone Shales, and he has described them as the 'Conglomerates underlying the Carboniferous Limestone.' The general relationship with regard to the beds above and below, viz., conformity with the beds above and unconformity with the beds below, is shown in the sketch-map.

For purposes of description it will be convenient to divide the district into three portions as follows :—

- (1) Chapel Beck, Blind Beck and Micklegill Beck.
- (2) Birk Beck, Stakeley Beck, etc.
- (3) The Lune, Redgill, Ellergill Beck and Langdale Beck.

Each illustrates some interesting point with regard to the deposits of this area.

(1). CHAPEL BECK, MICKLEGILL BECK AND BLIND BECK.—Of these three becks flowing from the north, Chapel Beck flow sinto the Lune and Micklegill Beck flows into Birk Beck, which is itself a tributary of the Lune, joining the latter at Tebay village. Blind Beck is a very small stream flowing between the two, and only introduced to show the continuity of the sections. These three becks have been linked together because their sections are similar, and because they show a passage from the Conglomerate Series into the Carboniferous Limestone. Both Micklegill Beck and Chapel Beck give good workable sections, the former being perhaps the more straightforward.

(a) In *Micklegill Beck*, just above and below the position where it is crossed by the railway, deep red sandstones are exposed, dipping 8° N. 24° E. These sandstones are well bedded, and the harder bands form well marked ledges and falls in the stream. About 80 yards above the railway crossing, and overlying these red sandstones, is a band of red conglomerates, fairly coarse, with pebbles up to 5 in. across, rounded and sub-angular. This conglomerate forms the bed of the stream for about another 80 yards, when it is overlain by red sandstones dipping 8° N. 16° E. These red sandstones are similar to those mentioned above, but perhaps slightly finer in grain, and they form the bed of the stream

for about 50 yards. Up to this point the deposits are red in colour, but from here upstream they are green or yellowish-green, and this is the point apparently taken on the one-inch geological map as the dividing line between the Conglomerates and the Lower Limestone Shales. Proceeding upstream these red sandstones are overlain for about 100 yards by a series of current-bedded yellowish-green sandstones and fine-grained conglomerates containing quartz pebbles. These sandstones have exactly the same dip and direction of dip as the red sandstones underlying them. They are succeeded, at the bend of the stream, by a bed of bluish-green shale about 12 in. thick, which is rather interesting, since it appears to contain some traces of carbonaceous matter which may represent plant remains. It is also a consistent bed appearing similarly in Chapel Beck, and its dip is in agreement with those of the beds below. Above the shale band for about 120 yards the stream flows over light green conglomerate, fairly coarse, pebbles up to two inches across, containing a fair amount of quartz, pink feldspars and an interesting assembly of rocks, both sedimentary and igneous. This is then overlain by a dark sandy rock which, for the time being, we may term a mudstone, and then in the quarry near to Sproatgill Well a dun-coloured limestone is exposed. Thus in this beck a sequence can be traced from the red sandstones and conglomerate to the limestone, the dips all the way through being constant in direction and amount.

(b) In *Chapel Beck* there is a similar section agreeing with that in *Micklegill Beck* in practically every detail. There is thus no need to repeat the description except to note that here again the dip is about eight degrees, though the direction is slightly more northerly; that the beds seem a little disturbed, and some splendid faulted pebbles were obtained here; that the red conglomerates are coarser, with pebbles 9 in. to 10 in. across; and that the bluish-green shale band is again present.

(c) *Blind Beck* is only a small stream and does not give the complete sections mentioned above, simply because it does not give exposures higher than the red sandstones. It is useful in showing, however, that the red sandstones are present in the lower portion of its course.

(To be continued).

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As one of Pitman's Mastery Series appears **The Mastery of Water**, by the author of 'The Triumph of Man,' whoever he may be. By the aid of numerous photographs, diagrams, etc., an entertaining account is given of water and its various aspects, in addition to which there are articles on Water Supply, Engineering Schemes in connection with water, Canals, Reservoirs, Rivers, Pumps, etc.

THE MILLSTONE GRITS W. OF HUDDERSFIELD—II.*

W. S. BISAT.

As the result of further work in the Huddersfield district, it is possible to put on record the following additional notes of exposures of marine bands in the Millstone Grits of the Marsden area :—

(1) The clay shales previously recorded as occurring at about 875 ft. O.D. in the banks of Bradley Brook, near Holt Head, have now been examined. *Glyphioceras bilingue* occurs in profusion, with a few *Pterinopecten papyraceus* and *Posidoniella laevis*. There is also another goniatite, larger than *G. bilingue*, not yet identified.

There seems no doubt that this exposure, and those at Brow Grains and Royd Edge, are in the same beds.

(2) *The Wessenden Valley*.—(a) The overflow from Wessenden Old Reservoir cuts through clay shales and forms a picturesque waterfall leading down to the old stream. The section is approximately :—

Clay shales above the fall with <i>Glyphioceras reticulatum</i> and <i>Pterinopecten papyraceus</i>	
Rock, forming the upper part of the fall ...	25 ft.
Hard Shales, at the foot of the fall, with <i>Lingula</i> , <i>Aviculopecten</i> cf. <i>clathratus</i> , <i>Nucula</i> , <i>Bellerophon</i> , <i>Sanguinolites occidentalis</i> ...	18 ft.

The lamellibranchs I have referred to *Sanguinolites occidentalis* agree very well with the description and figures given by Hind (*Trans. Roy. Soc., Edin.*, Vol. XLVI., pp. 348, 349. Pl. 2, Figs. 36-38), and form a new record for Yorkshire. These Nebraskan-Scottish species keep turning up in the Yorkshire Grits. This makes the sixth North-American species recorded from Yorkshire, the others being *Protoschizodus curtus*, *Schizodus wheeleri*, *Aviculopecten occidentalis*, *Aviculopecten carboniferus*, *Prothyris elegans*.

(b) At the west end of Blakeley Reservoir Embankment is a fine section, approximately as under :—

Sandstone Rock ...	30 ft. +	
Blue sandy shales ...	30 ft.	
Sandstone rock ...	30 ft.	
Blue shales sandier than above 30 ft. of shales }	30 ft.	{ Numerous cf. <i>Allorisma sulcata</i> at about 17 ft. down, in a very narrow band.
Wet Clay Shales (partially obscured by luxuriant vegetation), turning sandier downwards, but probably again clayey at the base }	30 ft.	No fauna seen.
Sandstone (A of waterworks sections), at west foot of Bywash.	20 ft. +	

* For first paper see *The Naturalist*, November, 1920, pp. 347-352.

I suspect a marine band in the shales at the top of the 20 ft.+ of sandstone rock, but could find no exposure. Endeavour should be made by local workers to trace an exposure, as the horizon is the lowest in the neighbourhood and might yield important zonal evidence.

(3) There is a large disused quarry on the south side of the Huddersfield-Marsden road, near Linthwaite; well seen from the railway. It gives a magnificent section, approximately as under:—

Shales and sandstone bands	40 ft.	
Dark shales	... ..	40 ft.
Clay shales, with <i>Glyphioceras reticulatum</i> , <i>Pterinopecten papyraceus</i> , <i>Posidoniella lævis</i>	6 ft.	{ Seen on floor of quarry near south-east face. Compare with band in Rake Dike, Holme, at 1,250 ft. O.D.
Rock in bands	... ..
Solid sandstone rock	12 ft.	

There is a fine shale scarp formed by the River Colne a little further west and immediately below the Huddersfield-Marsden high road. This shews about 50 ft. of blue sandy shales apparently unfossiliferous.

In the Meltham-Marsden area we therefore now have the following definite succession, in descending order:—

- (1) Shales under Rough Rock with *Gastrioceras listeri*.
Rock A of Survey and underlying sandy shales.
- (2) Clay shales with *Glyphioceras bilingue*.
Measures.
- (3) Lamellibranch band seen in quarry on Holt Head-Slaithwaite road at 775 ft. O.D.
Measures.
- (4) *Reticulatum* band—Wessenden Old Reservoir, above waterfall.
Rock.
- (5) *Lingula* and lamellibranch band—Wessenden Old Reservoir, foot of waterfall.
Measures.
- (6) Lamellibranch band—Blakeley Reservoir Embankment.

There are also the following exposures not yet definitely fixed in the above sequence:—

(a) The nodular *reticulatum* band of Slaithwaite and Oxhouse. This is definitely below (3). It may be between (3) and (4) or equal to (4).

(b) The *reticulatum* band in the Linthwaite quarry. This must be below (2) and may be between (2) and (4) or equal to (4).

(c) The *Lingula* band at Butterley Reservoir may be equal to (5) or between (5) and (6).

(d) The band with *Sanguinolites ovalis* discovered by Barnes, at Holt Head, has not yet been rediscovered. Its position is therefore uncertain.

(e) The fossiliferous grit at Pule Hill, Marsden, described by Barnes and Holroyd, is probably between (3) and (5).

Thanks are again due to Dr. Woodhead for assistance in the field.

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Hen Harrier, *Circus cyaneus* L., in Upper Wharfedale.

—About the middle of October a pair of Harriers made its appearance on Barden Fell. Unfortunately the birds confined their attention to feeding upon Grouse—probably because there was little else living in that neighbourhood excepting Red Grouse. The local gamekeeper, who is an intelligent man and does not destroy the Kestrels and Merlins, was upset by the numbers of dead and partially eaten bodies of Grouse that he found lying about. In his own words ‘they flew round in big circles, and then swooped down and shot along quite low and very fast, in a straight line.’ On November 9th he shot one of the birds near to Simon’s Seat. It was identified by the Rev. C. F. Tomlinson, Rector of Bolton Abbey (who measured it as 18 inches) and by his brother-in-law, Dr. W. F. Buckle, as a male Hen Harrier, in immature plumage. The hope of the keeper that the other bird would depart on the demise of its mate was not realised, and on November 24th he shot the second bird when it was actually devouring the breast of a Grouse near Laund Pasture, Barden Fell. This bird was forwarded to me en route to the taxidermist, and it proved to be a female Hen Harrier, or ‘Ring-tail.’ I took it to be in the last stage of immaturity by the tawny brown colour between the five black bars of its tail. This was confirmed by the taxidermist who wrote, ‘it would have bred next year (as it) contained small eggs.’ Its total length was 20 in., its wing measurement 19 inches (from carpal joint, 14½ inches) and its wing expanse 43 inches. It weighed 1 lb. 2 oz., and its primaries were emarginated on both the outer and the inner webs, from the second to the fifth inclusive. As the female had been shot devouring the breast of a Grouse, I opened her mouth, and with a skewer extracted quite a teaspoonful of Grouse flesh from around her tongue, and in her gullet. This was almost cut as fine as though it had been through a mincing machine. Although it was undoubtedly Grouse flesh, it was curiously entirely devoid of smell. I have to thank the Rev. C. F. Tomlinson, for whom the female bird is being preserved, for particulars of this record. The male is being preserved for Dr. W. F. Buckle.—H. B. BOOTH, Ben Rhydding.

REVIEWS AND BOOK NOTICES.

Mr. T. V. Barker, lecturer in Chemical Crystallography, has published a pamphlet on **The Study of Crystals in Schools**, being the substance of two lecture-demonstrations given at the University Museum, Oxford (15 pp., 11d. post free). This will appeal to teachers.

Notes on Geological Map Reading, by **Alfred Harker** (1920, Heffer & Sons, 64 pp., 3/6). Our former colleague on the editorial staff of *The Naturalist* is essentially a field geologist, and has had a tremendous experience of mapping and map-reading. The present little work, which is illustrated by an enormous number of diagrams, is the result of practical work, and will be of especial value to amateur or professional geologists.

Tales of the Ridings (83 pp.). **More Tales of the Ridings** (84 pp.). These two volumes by the late **F. W. Moorman**, of the Leeds University, have been issued at 2/6 each in paper covers, or 3/6 in cloth, and contain interesting dialect stories, for the collection of which Prof. Moorman was so well known. The volumes will particularly appeal to Yorkshiremen, and we feel it is only necessary to draw the attention of our readers to them. The first of the books mentioned contains a memoir of the author by Prof. C. Vaughan, with portrait.

Some little time ago the Leicester Literary and Philosophical Society issued a rather substantial volume on **The Keuper Marls Around Charnwood**, by **Prof. T. O. Bosworth**, 129 pp., paper covers 4/-, cloth, 5/-. Prof. Bosworth has had exceptional opportunity for examining these beds, and the wealth of illustration is remarkable in view of the small price of the volume, there being maps, plates and diagrams to illustrate each of the interesting points he brings forward. The book is on sale at the Leicester Museum, and we trust our readers will encourage the Society in its enterprise by purchasing a copy.

The Metropolitan Museum of Art, New York, has issued a **Catalogue of Engraved Gems of the Classical Style**, by **Gisela M. A. Richter, Litt. D.** In the characteristic style of our friends across the water, the volume is remarkably well illustrated by nearly a hundred plates, as well as by numerous figures in the text. The work illustrates the remarkably skilled way in which the American Museums collect, and having collected, bring the wealth of the contents of their cases before the public by means of very good handbooks. An introduction deals with the history of Gems, Engravers, Forgers, etc., which is followed by a detailed catalogue of specimens dating from the earliest times.

We remember once seeing at a Fair an enormous cart horse and a Shetland pony being driven side by side, and the effect was certainly ludicrous. We are reminded of this by the names of the authors (Dr. A. E. Trueman and Mr. W. Percival Westell), appearing in a volume entitled **Every Boy's Book of Geology**, published by the R.T.S., 4 Bouverie Street, London (315 pp., 6/- net.) An attempt is made to give a fascinating account of geological features likely to interest beginners, and there are numerous illustrations, some of which are on the crude side. The work is uneven, and had it appeared under either one or other of the author's names, we could have reviewed it at greater length.

A History of the Fens of South Lincolnshire, by **W. H. Wheeler** (Simpkin, Marshall & Co., 489 pp., plus various appendices, 25/-). In this volume a former contributor to *The Naturalist* has brought together a wealth of information relating to the Lincolnshire Fenland. The first edition appeared so long ago as 1868, and since then the late author had collected an enormous number of old maps and facts, which he has put together in this substantial work. There is a chapter on Natural History, but this is admittedly largely obtained from Miller and Skerchley's volume on The Fenland, and other sources. There are numerous appendices, containing names of places, list of books, Acts of Parliament, Rainfall Statistics, etc.

SOME DERBYSHIRE PLANT-GALLS.—II.

JAMES MEIKLE BROWN, B.SC., F.L.S., F.E.S., F.C.S.

SINCE the previous list of plant-galls found in Derbyshire was prepared (*The Naturalist*, October, 1919, pp. 330-332), a number of additional galls have been obtained. These were collected from the same parts of Derbyshire as referred to before, but most of them are additional also to the list given by E. and H. Drabble (*The Naturalist*, Jan., 1920, pp. 11-15). In two or three cases fresh localities are given for galls previously listed.

Several here recorded appear to be distinctly scarce in the district, only one plant of *Viola canina* was noticed galled by *Perrisia affinis*, and *Aulax glechomae* observed last year in Via Gellia was not found this year. Although dozens of heads of *Centaurea nigra* were examined, no galls of *Urophora solstitialis* were found, though this gall is quite common in many parts of Yorkshire (Brown, *The Naturalist*, February, 1920, p. 74; Falconer, *The Naturalist*, December, 1919, p. 392, and December, 1918, p. 384).

In the meadows at Bakewell were several plants of *Lathyrus pratensis*, of which the leaflets of the upper leaves were folded boatwise, and within the fold several individuals of a species of *Thrips* were living. The appearance suggested an incipient gall-formation. *Thrips*, I believe, are not known to produce galls in this country, though they are reported to do so in France (Houard, *Les Zoocccidies des Plantes d'Europe*, pp. 1339 and 1345), Germany (Houard, *op. cit.* p. 1468), and Australia (Sharp, *Cambridge Natural History*, vol. 6, p. 530).

HYMENOPTERA.

Trigonaspis megaptera Panz. On oak. Scarce. Holmesfield.

Pontania salicis Christ. On *Salix purpurea* L. Bakewell.

Andricus curvator Hartig. Common on leaves of *Quercus Robur* L.
Stanton-in-the-Peak

Cryptocampus venustus Zadd. On *Salix Caprea* L. Leaf-base and petiole swollen, with a more or less central cavity containing the whitish grub. Swanton (*British Plant Galls*, p. 148) seems to refer to *C. saliceti* Fall. as also causing enlargement of the leaf-base and petiole. Houard (*op. cit.* pp. 137 and 142) gives *C. venustus* as producing enlargement of the leaf-base and petiole, and *C. saliceti* and *C. ater* as attacking the axillary bud. Plentiful amongst a group of young trees, Stanton-in-the-Peak.

Dryophanta similis Adl. form *longiventris* (Hart.), on leaves of oak. Not common. Stanton-in-the-Peak.

DIPTERA.

Contarinia campanulae Kieff. On *Campanula rotundifolia* L. Plentiful. Eyam Moor.

Contarinia helianthemii Hardy. On *Helianthemum Chamaecistus* Mill. Lathkil Dale.

Contarinia steini Karsch. On flowers of *Lychnis dioica* L. Bakewell.
C. betulina Kieff. On *Betula alba* L. Bakewell.

? *C. barbichei* Kieff. On *Lotus corniculatus* L. Upper internodes

shortened so that the young shoot takes the form of an ovoid cluster of leaves forming a gall, and containing *whitish* larvæ. This gall, which occurred in large numbers on small specimens of the plant at Ashford-in-the-Water, corresponds well with the description given by Houard (*op. cit.* p. 620, No. 3617) for *C. barbichei*.

- Perrisia galii* H. Löw. On *Galium verum* L. Plentiful. Lathkil Dale.
Perrisia kiefferiana Rübs. On *Epilobium angustifolium* L. Causing the leaf-margins to be rolled under, the rolls containing a white grub. Lathkil Dale. (See also Brown, *The Naturalist*, February, 1920, p. 73.)
Perrisia affinis Kieff. On *Viola canina* L. Leaf-margins rolled upwards, thickened, coloured greenish-violet, the rolls containing either white grubs or pupæ. Apparently very scarce. Via Gellia.
Perrisia viciae Kieff. On *Vicia sativa* L. Common. Lathkil Dale, Bakewell, Cordwell.
P. lathyricola Rübs. On *Lathyrus pratensis* L. Stipules of the upper leaves swollen and thickened, enclosing the young leaves, and the reddish grubs. Swanton (*op. cit.*, p. 214) describes this gall as consisting of the leaf folded pod-wise, with swollen mid-rib forming a keel; but in all the galls observed by me, it was the stipules that were especially swollen and enclosed the larvæ (as also Houard, p. 642, No. 3771). Fairly plentiful. Bakewell.
P. loticola Rübs. On *Lotus corniculatus* L. Plentiful. Eyam Moor.
P. ranunculi Bremi. On *Ranunculus acris* L. Not very common. Bakewell.
P. rosarum Hardy. On *Rosa canina* L. Bakewell.
P. plicatrix H. Löw. On *Rubus fruticosus* L. Bakewell.
P. serotina Winn. On *Hypericum hirsutum* L. Not common. Monsal Dale.
P. gallicola F. Löw. On *Galium Cruciata* Scop. More frequently reported on other species of *Galium*. Plentiful. Monsal Dale, Over-Haddon.
Oligotrophus bursarius Bremi. On *Nepeta hederacea* Trev. Common. Monsal Dale. Lathkil Dale, and elsewhere.
Anthomyia signata Brischke. On *Lastrea Filix-mas* Presl. Bakewell.
Stictodiplosis jacobaea H. Löw. On *Senecio Jacobaea* L. Lathkil Dale, Monsal Dale.
Macrodiplosis dryobia F. Löw. On *Quercus Robur* L. Bakewell.
Macrolabis corrugans F. Löw. On *Heracleum Sphondylium* L. Bakewell.
Rhabdophaga salicis Schrank. On *Salix Caprea* L. Plentiful. Cordwell.

COLEOPTERA.

- Mecynus beccabungae* L. On *Scrophularia nodosa* L. Monsal Dale.

ACARI.

- Eriophyes thomasi* Nalepa. On *Thymus Serpyllum* L. Common. Lathkil Dale.
Eriophyes rudis Can. var. *longisetosa* Nal. On *Betula alba* L. Via Gellia.
E. galii Karp. On leaves of *Galium saxatile* L. The mites contained within the rolls of the leaves probably belong to this species, which attacks various species of *Galium*. Hathersage.

FUNGI.

- Protomyces pachydermus* Thüm. On *Taraxacum officinale* Weber. Cordwell.
Urocystis anemones Persoon. On *Ranunculus acris* L. Common. Bakewell and District.
Puccinia poarum Nielsen. On *Tussilago Farfara* L. Winster.
Taphrina aurea Fries. On leaves of *Populus tremula* L. Bakewell.

CHIRONOMID PARASITE AND ITS EFFECTS.

JOHN H. ASHWORTH.

MIALL and Hammond, in their Monograph on the Harlequin Fly, warn students against the irregularities and troubles they will experience from the presence of parasites in the sections under microscopic examination, particularly mentioning *Mermis* as infesting *Chironomus* larvæ.

In August last an example was found of *Chironomus plumosus* showing female antennæ, but with anal appendages like those of the male. Three or four weeks later about half-a-dozen similar specimens were seen on one evening. Three of these were secured, and when examining them through the lens a few minutes later, a worm was seen to be protruding from the abdomen of one of them. The worm continued to emerge and wrap itself in a coil, the halteres of the fly meanwhile developing a blood-red tinge. During the evening the second specimen, the mid-femora and tibia of which had meanwhile acquired a reddish colour, also produced a green worm; the third was therefore placed in a separate tube to await results. Nothing further showed next day, but on the morning following, the fly was found to be dead, part of the genitalia being bright red, while a dark, smooth, green worm about an inch long also occupied the tube—the difficulty being to understand how such a large parasite could have been stowed in such a small host—less than a half inch in full length. On examining the August specimen it was seen also to be bearing a partially-emerged green worm, so that there would appear to be some connexion between the dual sexuality displayed by these Diptera and their being infested by this Annelid parasite.

Considering the zeal displayed by some systematists in the past, our fauna might easily have been enriched by two or three new species, if not another genus, our present classification including numerous cases of species differing by little more than the colour of the halteres or a joint of the legs, whilst under a lens and low power of the microscope the third specimen (which seemed a true hermaphrodite) showed another joint to the antenna, as if it were a male near *Smittia* Holmgr., *Telematogeton* Sh., or *Chasmatonotus* H.Lw. (Kieffer in 'Genera Insectorum.')

Under a higher power, however, the number of joints might be put down as anything from seven to ten, according to the ideas of the observer, to the lasting confusion of succeeding workers having a different idea as to what constitutes a joint.

Later in September, and afterwards in October, numbers of females were taken, some of which proved to be infested

by two or even three worms. While under observation it was noticed that the worms after emerging, retained a hold on the Chironomus, and imbibed the juice or blood of the insect. A drop of this fluid on the side of the glass tube was of a reddish colour, but when the worm became detached immediately changed to a green similar in tinge to the colour of the worm.

Problems remain as whether Chironomids with plumed antennæ and male genitalia can be found infested with these parasites, and if so, at what stage of existence the worms begin their attack, and if on the larvæ, how it happens that the antennæ are affected.

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ENTOMOLOGY.

Boreus hyemalis in Yorkshire.—Looking over some mosses on limestone walls at the foot of Smearsett, on Nov. 14th, 1920, I found a specimen of *Boreus hyemalis*. This near but wingless relative of the Scorpion Fly, *Panorpa communis*, does not seem to have been previously recorded for Yorkshire; but Mr. G. T. Porritt informs me that Mr. Walsh has recently taken it near Scarborough [see below].—CHRIS A. CHEETHAM.

Forficula auricularia L. var. forcipata Steph. in Yorkshire.—To the localities for this interesting male form (*antea*, p. 362) can now be added the East Riding; a single dead specimen occurred to me on October 25th under a plant of *Erodium* in a sand-pit near Flixton. Under the same plant occurred also an example of the weevil *Phytonomus fasciculatus* Herbst. The only other known Yorkshire locality is Spurn, where Mr. T. Stainforth and I took several specimens last year.—GEO. B. WALSH, B.Sc., Scarborough.

The var. *forcipata* of *F. auricularia* is not rare, and probably occurs among an abundance of the type in any locality.—G.T.P.

Boreus hyemalis L.—A New Yorkshire Neuropteran.—On November 6th, while working moss on Hay Brow, near Scalby, for the beetle *Mniophila muscorum* Koch, I took a pair of the curious Panorpid *Boreus hyemalis* L., the female nearly escaping by its powers of jumping. This is apparently a new Yorkshire record; in any case the insect seems to be extremely local, for these are the first specimens I have ever seen alive.—GEO. B. WALSH, B.Sc., Scarborough.

Boreus hyemalis is a most interesting addition to the Yorkshire List, as it has been recorded from but few localities in England. More specimens have been taken in Scotland, but it has always been regarded somewhat as a rarity in Britain.—G. T. P.

KEY TO THE HARPIDIROID HYPNA.

I. A. WHELDON.

So much has been written upon this polymorphous group of plants, that some apology is perhaps needed for this paper. The key here presented was drawn up at the request of one of my most stimulating bryological correspondents, the late Prof. T. Barker. He wrote to me in March, 1902, criticising my 'North of England Harpidia' which had just appeared in *The Naturalist* to the following effect:—

'What I chiefly miss in the paper itself is a "Key" to the species, varieties and forms. Without this it often takes a long time to find the name of any specimen. With a key you get quickly to the probable name, and then it does not take long to compare the specimen and description, and see if they agree.' Later he again wrote: 'I am strongly prejudiced in favour of keys. I think they should be made even if not printed, because the process, almost more than anything else, compels a man to form clear crisp opinions. It is an article of my creed that when a man who knows a group of plants or animals cannot make a key that will work, it is because the species and varieties are not distinct. . . . Schimper's "Synopsis" is to me a very difficult book, and almost hopeless unless I can first otherwise get at the probable name of a specimen.' In a later letter offering much useful and helpful criticism, he writes: 'I must not keep your key to the Harpidia longer. It seems to me to be really a key, and not a series of condensed descriptions. A dichotomous key is a very great help to a tyro; those in Dixon's Handbook are very time-saving, and the want of them makes it very tedious to find out an unknown moss by help of Schimper's "Synopsis." I hope you will publish the key in due course, as it is too useful to be consigned to oblivion.'

After eighteen years, I find the key has needed many alterations. Not the least difficulty has been the selection of a generic name or names! At first the choice was between *Amblystegium*, *Hypnum* and *Drepanocladus*. As the study of mosses has progressed, there has been a gradual evolution of our ideas as to the limits of genera. Such genera as *Jungermannia*, *Hypnum*, etc., served their purpose until, by the growth in the number of species, they became too unwieldy. They were then divided into sections, which were speedily raised to sub-genera and finally to genera. The Harpidioid Hypna were for a time classed under *Amblystegium* or *Hypnum*, under sections 'Harpidium,' 'Scorpidium' and 'Cratoneuron.' These groups next emerged as genera, the first named becoming *Drepanocladus*, because *Harpidium* was untenable. In common with other hypnoid genera, such as *Campylium*,

Calliergon and *Stereodon*, they are very closely allied, and hardly separable by other than slight modifications of the gametophyte. Earlier Bryologists would have considered these features as of no generic value. In these highly developed tribes of mosses the sporophyte exhibits remarkable uniformity of structure, and the deviations presented by the vegetative phase therefore assume considerable importance. As this key was originally written, *Hypnum* was adopted as the generic name, following *Muscologia Gallica*, the North of England Harpidia, and Dixon's 'Handbook of British Mosses.' An examination of botanical literature, however, shows that systematists now regularly treat the sub-sections of *Hypnum* as genera, a course which has my entire approval. These smaller generic names are much more instructive and expressive, and are of practical convenience, too, in arranging collections. It will be observed that *Drepanocladus* has itself been further divided. As pointed out by Loeske,¹ the group was an incongruous one, containing species more widely differing from each other than they did from neighbouring genera. Whilst welcoming his improved classification, one regrets that he did not follow the classical example of *Lejeunia*, in the sub-division of which the names of the newer genera indicate their relationship to the original collective genus. Besides the generic names, other difficulties had to be faced, owing to the polymorphism of the species. Their study has been mostly conducted on herbarium specimens, from which it is not always possible to appraise correctly the value of varietal forms. In deciding which to retain, I have erred on the side of retention rather than rejection; it is so easy to say 'Oh, that is a mere temporary form,' but it is much more difficult to prove it. Roth wrote of so well marked a plant as *W. fluitans* var. *atlantica* 'aus England macht mir mehr den Eindruck einer Kümmerlichen Form.'² But in 1909 he wrote to me saying: 'Renauld is right writing to me '*H. fluitans* var. *atlanticum* dait être maintenue.' Hitherto I possessed only a juvenile form of this plant.' Roth was no doubt right to adopt this cautious attitude, as many forms which appear very distinct in the herbarium prove on better acquaintance to be only starved, juvenile, or seasonal variations. Others are ecological forms, and it is a moot point whether these are not entitled to recognition and distinctive names. Prolonged study of moss variation leads to the conclusion that the vast majority of the varieties are simply the direct expression of environmental moulding.¹⁵ It does not seem desirable to entirely ignore such variations, as they are constantly reproduced where the necessary conditions prevail, as may be seen in numerous alpine, dune and xerophytic adaptations. Although it is quite probable that too many varieties and forms have been

maintained, this may be regarded as a venial sin compared with that of making a too sweeping reduction of their number. The older botanists in England looked askance at the introduction of new varieties, whilst their continental confreres perhaps erred in the opposite extreme. The result in this country was that there was a constant effort to fit square pegs into round holes; and our older herbaria sometimes contain an incongruous admixture of different forms under one label. Many of the minor forms described in continental works are of little importance, but their lists present perhaps a truer and more natural view of this polymorphous group than that of our own botanists of the last generation.

The arrangement adopted here is in some respects a compromise between that of the 'North of England Harpidia,'⁹ adopted from Renault,⁷ and that of Loeske.¹ Some of the larger and more polymorphous species have, as a matter of convenience, been divided into sub-species. On the other hand the old *Drepanocladus Kneiffii* and *D. polycarpus* have been merged, as previously suggested by me,⁸ as no satisfactory or constant line of demarcation can be drawn between them. *D. aquaticus* has been subordinated to *D. pseudofluitans* in preference to regarding it as a distinct species, or as a variety of *D. aduncus*. *Warnstorfia serrata* is doubtfully maintained as a species until it has been studied further. From my limited experience of it, its two forms *Lindbergii* and *Mildei* have no constant differential characters apart from the inflorescence, and this is not always available. Their case is analagous to that of *Bryum pseudotriquetrum* and *B. bimum*. Renault³ regarded one as a *fluitans* and the other as an *exannulatum* form. I follow Renault and Monkemeyer⁴ in rejecting *Drepanocladus simplicissimus*, although Roth² follows Warnstorf in giving it full specific rank. I agree with Renault¹⁰ and Dixon⁵ that *D. capillifolius* should be maintained as a species, although Monkemeyer⁴ gives some cogent arguments against this course. It follows, to be consistent, that *Warnstorfia Retac* should be considered to be distinct from *W. exannulata*. I have not been able to see a specimen of *Hypnum fluitans* var. *Brotheri* Sanio.¹³ Renault³ does not attempt to indicate its affinities with his various *fluitans* groups, but Roth² puts it near var. *Arnellii* and indicates some features in which it approaches *W. exannulata*. It may be remarked that Renault figures it with a finely acuminate leaf point, and describes it as 'Feuilles finement acuminées munies au sommet de petites dents espacées.' Roth, on the contrary, says: 'mit ganzrandigen, kurz and breit zugespitzten Blättern.' Sanio's original description is as follows: 'foliis acutis acuminatisve, repandulis vel apice singulis denticulis serrulatis.' I have not attempted to place

this in the absence of specimens, nor have I included *Drepanocladus furcatus* Roth, which, as Monkemeyer¹⁴ has pointed out, is *Limnobium ochraceum* var. *uncinatum*, a plant which has more than once been sent to me as a Harpidium by British collectors! The forms of *Cratoneuron* are also constantly sent as 'Drepanocladus,' etc. They are so often confused with the other Harpidia, that it seemed desirable to include them in the key. I should imagine that all our herbaria contain *C. falcatum* labelled '*Hypnum vernicosum*,' although almost the only feature they have in common is the plication of the leaves.

A word is perhaps necessary on taking up herbarium specimens of these plants. They should be carefully collected in fair quantity, and as mature and representative as possible. It would be possible to pick out abnormal, juvenile or seasonal growths which could not be accurately named. In the herbarium they are misleading, unless accompanied by more characteristic shoots, which may nearly always be found.

Finally the "Key" is not intended to take the place of the descriptive handbook, but rather to act as an index. Unfortunately the literature on the subject is very scattered, so to facilitate the student's work, when he has found the probable name of his plant by aid of the key, a reference is given to the original description in the List, and to the pages in Dixon's 'Handbook of British Mosses' and Braithwaite's 'British Moss Flora' for such varieties as are quoted therein.

KEY TO GENERA, SPECIES AND MINOR FORMS.

1. Alar cells not forming distinct auricles, or if auricled, leaves obtuse and apiculate (2). Alar cells wider, forming more or less distinct and often decurrent auricles (3).

2. Nerve short and forked, double, or none: leaves broad and concave (A) SCORPIDIUM. Nerve longer, single: leaves entire, narrowly acuminate (B) LIMPRICHTIA. Some aberrant forms of Warnstorfia have the leaf auricles obsolete, but the margin is denticulate, and rhizoids occur at the back of the leaf apex occasionally.

3. Leaves toothed and plicate: perichaetial leaves longly convolute, making the perichaetium very prominent: cortical cells of stem inflated: inflorescence autoicous (C) SANONIA. Perichaetium less prominent: stem cortex not differentiated (4).

4. Stem clothed with rhizoids and paraphyllia: leaves distinctly plicate and strongly nerved: capsule annulate: inflorescence dioicous (D) CRATONEURON. Paraphyllia rare, or none: stem not rhizinose: leaves not plicate—sometimes lightly striate (5).

5. Leaves entire: capsule annulate: inflorescence dioicous (DREPANOCLADUS). Leaves normally serrate: capsule exannulate, inflorescence monoicous or dioicous (WARNSTORFIA).

(To be continued).

THE ECOLOGY OF THORNE WASTE.

REV. E. A. WOODRUFFE-PEACOCK, F.L.S., F.G.S., F.E.S., ETC.

(Continued from *The Naturalist* for 1920, p. 384).

I have the following notes, too, which I believe belong to these Crowle turbaries on the bog edge there :—*Aira aquatica*, *Andromeda polifolia*, *Caltha palustris*, *Carex vesicaria*, *Equisetum palustre*, *Eriophorum polystachion*, *Hippurus vulgaris*, *Hydrocotyle vulgaris*, *Juncus conglomeratus*, *J. effusus*, *J. campestris*, *Lycopodium clavatum*, *Myrica Gale*, *Nardus stricta*, *Pinguicula vulgaris*, *Schoenus albus*, *Schoenus mariscus*, *Scirpus palustris* and *Utricularia minor*, with the following mosses :—

Bryum hypnoides, *Hypnum cuspidatum*, *Sphagnum palustre* and *Confervae*, if these names mean anything to modern workers.

These notes would hardly fit any spot on this moor-bog known to me but its old turbaries. I fancy that they were at one time the Doctor's special ground for study, but as these notes are not localised, I may be wrong. (1.)

AGRICULTURE AND COMMERCE.

See my notes on the Ecology of Thorne Waste, *The Naturalist*, 1907, pp. 320-322. This is my full man-influenced peat-list.

Anagallis arvensis, *Anthriscus sylvestris*, *Arrhenatherum*, *Bellis*, *Bromus mollis*, and v. *B. glabratus*, *Capsella*, *Carex ovalis*, *Cerastium vulgatum*, *Chrysanthemum Leucanthemum*, *Cnicus arvensis*, *C. lanceolatus*, *Cuscuta trifolii*, *Dactylis*, *Festuca rubra*, *Ficaria*, *Galeopsis versicolor*, *Geranium molle*, *Hieracium Pilosella*, *Holcus lanatus*, *Hypochaeris radicata*, *Lepidium campestre*, *Linum catharticum*, *Lolium perenne*, *Lychnis alba*, *Matricaria Chamomilla*, *Mentha arvensis*, and hybrids, *Myosotis arvensis*, *M. versicolor*, *Papaver Rhoeas*, *Phalaris arundinacea* warp influence, *Plantago lanceolata*, *P. major*, *Poa annua*, *P. pratensis*, *P. trivialis*, *Polygonum amphibium* and v. *P. terrestre*, *P. Aviculare*, and v. *P. rurivagum*, *P. Persicaria*, *Potentilla anserina*, *P. reptans*, *Ranunculus arvensis*, *Raphanus Raphanistrum*, *Rumex crispus*, *Senecio erucifolius*, *S. Jacobaea*, *S. vulgaris*, *Spergula arvensis*, *S. sativa*, *Stellaria media*, *Trifolium repens*, the agricultural form only, *Tussilago Farfara*, *Urtica dioica*, *U. urens*, *Veronica agrestis*, *V. arvensis*, *V. Chamaedrys*, *V. officinalis*, *V. serpyllifolia* and *Viola arvensis*.

WARPING PERIOD.

The species of this area, while the warping is going on are, according to Dr. H. H. Corbett, *Aster Tripolium*,† *Atriplex*

deltoidea,† and *Scirpus maritimus*.† So far from the shore I have not yet heard of *Juncus Gerardi*, which has been taken on other warpings nearer the coast but in every case I believe boot or mammal foot carried. These three species are soon gone when the warping period is over. See *Journal of Botany*, 1917, pp. 333-4. (16.)

Scheuchzeria palustris L.—This was, from the plant collector's point of view, the only truly interesting species found in the whole area of this large bog. From the ecologist's point of view, it is duck-carried and so might be there or not, as the facts of carriage and local circumstance allowed. It is not there now, but, as it once abounded, we may safely reason only because there is no fitting ecological *nidus* for it. A few points remain to be settled about it—(1) when, (2) where, (3) by whom, and (4) under what circumstances, was it found. Dr. P. Ellis, though he had forgotten its scientific name in his old age, said it was the rarest plant in the district. He surely meant the most unusual in a wide area. There were far rarer, more transient, or unstable species even then on the waste, as *Hydrocharis*, *Utricularia minor* and *Zannichellia palustris* for instance. He said, 'it was found in 1830 or a little after,' and named a Mr. Harrison as connected with it. This is confirmed by Mr. A. Bennett's notes on *Scheuchzeria*, which say, 'Thorne Moor, near Doncaster, Mr. R. Harrison.*' Sir W. J. Hooker's *British Flora*, 2nd edition., 1831, p. 170. The next note in time is 'Thorne Moor, in great plenty.' S. Appleby, *Mag. Nat. Hist.*, 1832, Vol. V., p. 558. In the late Rev. J. K. Miller's notes, *The Naturalist*, 1895, p. 170, we read : 'Thorne Waste,' Crowle side, I learned from his son, George, under date, 16th July, 1840, 'most abundant in a little pool nearest to the Decoy, but found in others too.' F. A. Lees says, *Flora of West Yorks*, 1888, 'Sought in vain by Dr. Parsons in 1877-80. I found one flowerless example by one of the 'wells,' in company with Mr. W. Todd, in 1870; recognisable as *Scheuchzeria* by the pore at the tip of its leaf.' I saw nothing of it from 1874-81, when I was often on the waste, and it was not for want of looking in likely spots.

These are all the facts we have to work with. As far as they go they fully corroborate Dr. P. Ellis's statements as to its finder, and that it was in the old turbaries in pools on the Lincolnshire and Yorkshire edge of this peat bog, where I understood only a three-foot wide drain marked the county border. I have passed over this boundary many times not recognising it, and I do not know it to this day. When this spot was warped because it was the lowest ground—the tur-

* Does anyone know anything of this R. Harrison or of S. Appleby?

baries having cleared off the peat—this species fitting home was practically destroyed in this area. It should be noted that these turbaries began within a quarter of a mile of the village of Crowle, and like the decoy said to have been there too, belong to the seventeenth century, as well, no doubt, as a later date.

There is one other point of confirmation. Dr. Ellis and the Rev. J. K. Miller both name a decoy close to Crowle; and the Doctor implied that it had been warped over and buried with the turbaries years earlier. Now there are or were at least six decoys on Thorne Waste with this one of Messrs. Ellis and Miller; two near Goole, two near Thorne, one on the moor, in Yorkshire, two and a half miles from Crowle, from which the turf is being cut off now for warping. Archdeacon Stonehouse's *Hist. of the Isle of Axholme*, p. 68, says, there was (another?) one within a mile of Crowle, which was called even in my day 'Crowle Decoy' by old men, who could remember it before it was warped over. In which county it was I cannot say, but I believe in Yorkshire, on the very border. This could only be possible if it were due west of the village, which I understood it was—if north or south it was no doubt in Lincolnshire. I was told by W. Tune that the birds flighted over Lincolnshire to the Humber saltings in an evening. The 'New Decoy,' as I have heard it called as a lad, two and a half miles from Crowle, is most certainly in Yorkshire, but never had turbaries round it to my knowledge. It was too far away from that village with so much good peat nearer.

To sum up all the evidence available now. *Scheuchzeria* was found in pools in turbaries on the edge of the two counties, and it was 'in great numbers,' 'in great plenty,' and 'most abundant,' according to three quite independent witnesses, as it might be expected to be where there was little floral competition. This was the case before any warping was done, north, south, or west of Crowle. Since then the plant has become extinct, as there was no fitting spot elsewhere in my day on the moor.

I judge, therefore, that this point is at last finally settled for good. No doubt it was in both counties, as the turbaries certainly were, as Dr. P. Ellis said. If he were wrong in this, it is the only thing in which he has ever proved to be wrong. His still more wonderful facts about the Hazel nuts, twenty feet below the bed of the river Trent, bored by the Nut Beetle (*Balaninus nucum*, L.), has been demonstrated as true. See *Trans. Lincs. Nat. Union*, Vol. III., pp. 33, 116 and 166-168. He said, too, that *Scheuchzeria* had gone, for its natural conditions had been destroyed, and that I should never take it; and after years of hunting I have not in either county.

The object of these notes, however, is not to prove that *Scheuchzeria* was once in Lincolnshire, for which a three foot ditch in peat as a county boundary I am quite indifferent to the county question, but to point out that the ecology of these ancient turbaries, whatever parish or county they were in, on account of their lowness, *i.e.*, wetness, and of their broken scurf or floral blanket, were the only places it could be abundant in till other niduses were made for it by man's work. In my day, at least, the scurf of the great bog was far too overpowering except where fractured.

The Lincolnshire seed-carriage is from E. to W., or from the shore inland, as a rule with many exceptions from local movements of fowl. Sand-bog species are carried more directly N. to S. So far as I can judge with my past experience of Thorne moor, and present information, only two species are likely to have been seeded from W. to E. locally across this wide moor—*Corydalis claviculata* and *Lathyrus palustris*. *Scheuchzeria* and *Eriophorum latifolium* no doubt came from the N. to the S. by moorland bird-carriage.

There is only one other matter. Can anyone say whether there are any localised specimens of *Scheuchzeria* in existence from Thorne Waste? I have never heard of any in herbaria, neither has Mr. Arthur Bennett, who knows far more of existing specimens than I do. I have a specimen from this area, but it is unlocalised, I regret to say. So it may have been taken in anyone of the three counties; but *I have* good reason to believe that it was taken in Yorkshire, though the locality may have been in Lincolnshire.

PERSONS, BOOKS AND CONTRACTIONS.

1 Phineas Ellis, a doctor, of Crowle. He gave me the notes I use here in 1874-75. He is not to be confounded with his younger brother and partner, Henry, who lived there too and in 1880 supplied 10 (below) with certain information *re* Crowle 'New Decoy' as I call it, 2.5 miles away on the waste. As printed not quite accurate; I cannot believe that he said Beech for Birch, which was the species there.

2 W. Tunc, the late, of Eastoft, a very original and thoughtful labouring man naturalist, from whom next to Phineas Ellis, I obtained most valuable information in 1874-75.

3 Dr. W. G. Smith, late President of the L.N.U. (in 1919).

4 Rev. W. T. Humphrey, in 1874-75, Vicar of Eastoft, in Lincolnshire and Yorkshire. My first trainer in what is now called 'Ecological Botany.'

5 F. A. Lees, author of *The Flora of West Yorks*. As also by letters and in conversation.

6 The Rev. R. P. Norwood, now Vicar of Crowle.

7 Arthur Bennett, of Croyden. Letters and personal collections of notes on *Scheuchzeria palustris*.

8 Earl of Cromarty, *Phil. Trans*, v. 27.

9 Henry Ellis, brother and partner of Phineas Ellis.

- 10 Sir R. Payne-Gallwey's *Duck Decoys*, 1885.
- 11 The Rev. J. K. Miller, Vicar of Walkeringham, Notts., 1819-1855. 'Seventh wrangler in 1808, and sometime fellow of Trinity College, Cambridge. 'A splendid botanist for his day, and my own mother's trainer in it.' *The Naturalist*, 1895, pp. 159-171.
- 12 The Rev. Canon W. Fowler, of Liversedge, Yorks., President of the L.N.U. in 1884.
- 13 Samuel Hudson, the late, of Epworth.
- 14 William Casson, the late, of Thorne.
- 15 The Rev. N. C. Marris, then curate of Crowle. Now Vicar of Holy Trinity, Gainsborough.
- 16 H. H. Corbett, physician, of Doncaster.
- 17 H. F. Parsons, the late, physician, of Goole.
- 18 George Miller, the late, son of the Rev. J. K. Miller, of Holcombe, Bath.
- 19 W. A. E. Ussher's *Geology of North Lincs. and South Yorks.*, p. 152; and Drift Map Sheet 86.

C.=Central Moor. E.=East Moor. N.=North Moor. S.=South Moor. W.=West Moor. 'Side' understood with the last four.

The exposed peat is now all in Yorkshire, but its original east side, now wholly covered by warp, was in Lincolnshire. 1, 2, 18.

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BIRDS.

Late occurrence of House Martin in Yorkshire.—

On Sunday, November 21st, I saw a single House Martin, at a few yards distance, flying feebly along the ground near the trout stream at Lowthorpe. There was a dense fog at the time, and the thermometer stood at 34 degrees on the north wall of the house at 4 p.m., followed by the sharpest frost of the autumn, so far. No doubt the poor bird perished that night.—W. H. St. QUINTIN.

Large Migration of Wild Geese in Yorkshire.—During the week 18th-25th November, a very considerable migration of Wild Geese took place along the Yorkshire coast. The first flocks were seen on the 18th, when a few Brent Geese were passing, calling as they flew. Their voices could be heard in increasing numbers all night, and on the 19th, flock after flock, numbering from fifty to two hundred birds in a pack, passed in quick succession all day until late afternoon, when they slackened off. Many thousands must have passed during this time. Most were Brent Geese, but there were a few flocks of Grey Geese, which kept apart from their smaller relatives. Owing to the height at which they flew it was impossible to determine the species, probably they were Pink-footed Geese. Smaller flocks of both species were noted on November 20th, 21st, 22nd and 25th, on the latter date only Grey Geese being seen.—W. J. CLARKE, F.Z.S., Scarborough.

SOME NEW NATURAL HISTORY BOOKS.

Notwithstanding the extraordinary rise in the cost of printing, paper, binding, and in the production of books generally, there seems to be no decrease in the number of works issued dealing with Natural Science, and although the prices in some cases are rather severe, the quality of many of the publications is quite equal to that issued in pre-war days. Messrs. Longmans, as usual, seem to take the lead with the issue of Vol. I. of Thorburn's **British Mammals**, Vol. II. of which will be issued in the spring (2 vols, 10 guineas net). This handsome book is a companion to the Volumes on 'British Birds' and 'A Naturalist's Sketch Book,' already referred to in this journal, and besides containing details of the various Mammals, there are remarks on the Distribution, Colour, Measurements and Habits. The species dealt with in the present volume include 12 Bats, 5 Insect-eating Mammals, 15 Flesh-eating Mammals, 14 Rodents, 4 Ruminants and 20 Whales, etc. It contains 25 plates in Mr. Thorburn's inimitable style, in addition to which there are a number of pen-and-ink sketches as tail-pieces, etc. Not only do the plates portray the Mammals in characteristic attitudes, but the artist completes an effective picture by including the materials in which the particular animals revel. Thus, for instance, the plate of 'The Dormouse' represents a single specimen which does not occupy more than $2\frac{1}{2}$ ins. of the plate, and yet the colour-scheme of the autumn leaves and fruits, spiders, etc., all go to form a very pleasing and artistic picture. Just now, when particular interest is centred on the Bats, Mr. Thorburn's illustrations are especially appropriate, as he takes an extraordinary care to represent the colour of the fur as accurately as possible. At first the illustration of the Walrus was a little unexpected in this volume, but, of course, the species has been recorded in British waters, as also have various species of seals, which are so admirably drawn. By an extraordinary coincidence the face of the Badger, Plate 18, can be seen from two distinct points of view, though in one of them the left eye (which is the 'mouth' from another) appears to have been damaged by wasps, the comb of which is providing a meal!

Of distinctly scientific value, and on quite original lines, is Dr. J. Ritchie's handsome volume on **The Influence of Man on Animal Life in Scotland: A Study in Faunal Evolution** (Cambridge University Press, 550 pages, 28/- net). Dr. Ritchie's lectures contained in this volume were written with the object of tracing the effect man has had in various ways upon the fauna of his country. "A result of this enquiry has been to emphasize the instability and changefulness of a fauna, and a word may be said as to the general place of man's influence in the sum of change. Two types of changefulness affect a country's animals—one temporary in incidence and local in effect, a function of circumstance; the other persistent and general, a function of time. Within itself a fauna is in a constant state of uneasy restlessness, an assemblage of creatures which in its parts ebbs and flows as one local influence or another plays upon it. It may be that a succession of favourable seasons breeds many field-voles, and the tide of the field-vole race flows to its high-water mark of numbers. But this new food-supply brings to the feast hungry owls, hawks, stoats and others, and as the tide of the beasts and birds of prey flows, that of the voles ebbs. Yet no sooner is the ebb apparent than the carnivores themselves decline for lack of food; and eventually the dead level is reached again. So the story goes on—there is a constant ebb and flow of parts within the whole, a fauna is in unstable equilibrium, the 'balance of nature' is never quite struck." Dr. Ritchie begins with 'Scotland as man found it,' and refers to the extinct animals, and the conditions availing in prehistoric times. He then deals with the various species of cattle, sheep, horses and other similar animals; animals for food; their protection for sport, or for superstitious reasons, and so on, the whole forming the most fascinating series of articles, quite

distinct from the usual methods adopted in Natural History volumes. There are diagrams, views of the various species dealt with, maps showing distribution, and so on.

Messrs. W. & R. Chambers, Edinburgh, have issued a massive volume by **H. Mortimer Batten**, entitled **Habits and Characters of British Wild Animals**, which is illustrated by black and white and coloured illustrations, by Warwick Reynolds. Mr. Batten's word 'Animals' is confined to the Mammals, and he deals at some length with 'Red Deer, Roe-deer or the Roebuck, Fox, Weazel and the Stoat, Otter, Pine-Marten, Badger, Polecat, Brown Hare, Blue or Mountain Hare, Rabbit, Hedgehog, Squirrel, Gray or Brown Rat, Water-rat, Wild Cat.' The author endeavours to achieve some degree of originality by writing from practical observations, and without the aid of references, and his chapters certainly indicate familiarity with the species he describes. The author is fortunate in securing the drawings of Mr. Warwick Reynolds, which are on quite new lines.

Under the title of **The Wild Unmasked** (by the same publishers), **F. St. Mars** writes a volume in a more or less chatty style, in which the habits of Field Mice, Ravens, and a whole host of familiar Mammals and birds are described, and evidently the author is fairly familiar with their haunts. The book requires careful perusal in order to ascertain precisely the various species dealt with. Certainly it cannot be obtained from the chapters, etc., among the titles of which we notice 'The Master-Hun, Notice to Quit, The Old White Devil, Fizzle's Angel, The Forlorn Hope, A Pygmy in Armour, A Real Hero, The Great Adventure, The Call of the Flock, The New World, The Cry, Sapper Mauldy, and The Hustlers.' We can recommend the volume as a very fascinating story, which is considerably helped by Harry Rowntree's sketches.

From the same house is a small volume entitled **Tracks and Tracking: A Book for Boy Scouts, Girl Guides and every Lover of Woodcraft**; also by **Mr. H. Mortimer Batten** (95 pp., 2/-) in which are illustrations of tracks of Mammals and Birds, running or walking, etc.; also plans showing rabbit tracks in the vicinity of warrens, and other information likely to be of service to young people who wish to use their eyes, and incidentally older folks might derive much useful information by a perusal of its pages.

Messrs. Witherby & Co. have issued a volume of exceptional merit, entitled **A Naturalist in Himalaya**, by **R. W. G. Hingston, M.C.** (300 pp., price 18/-). Dr. Hingston visited the Himalaya between 1914-1916, and made many valuable observations upon the fauna of that part of the world. The volume deals principally with Insect Life, the observations on the various species of ants and spiders being exceptionally valuable. His work, however, is not confined to these, as we have information relating to Glow-worms, Shells, Birds, Molluscs, and even Mammals, the photographs of the leopard being especially interesting, those facing pages 248 and 252 being remarkable for the way in which the animal is represented against a background which almost precisely resembles its markings. The volume concludes with a geological sketch of the district.

Another Indian Volume has been issued by Mr. John Lane, and is entitled **The Dairy of a Sportsman Naturalist in India**, by **E. P. Stebbing** (298 pp., 21/- net). The artist is very free with his pencil, and quite a large proportion of the pages has been improved by his small sketches, many of which well 'hit-off' the characteristics of the animals he so carefully describes. The camera has also been extensively used, and in this manner the narratives of his hunting expeditions are rendered doubly entertaining. The title 'Sportsman Naturalist' is justified. Most of the information was ready for the press in 1914, but was held over for more favourable times, but the chapters are none the less interesting on that account. We observe that the author considers

that 'India is threatened with an irretrievable decrease in and deterioration of the most interesting members of its Fauna.'

At the same price, Mr. John Murray has published **Territory in Bird Life**, by **H. Eliot Howard**, a feature of which volume is the unusually artistic series of illustrations in photogravure by G. E. Lodge and H. Gronvold. These are certainly some of the finest of their kind that we have seen in a work of this character. Mr. Howard treats the subject rather differently from the usual run of natural history books, as will be gathered from the following headings of the chapters:—The Disposition to Secure a Territory; The Disposition to Defend a Territory; The Relation of Song to the Territory; The Relation of the Territory to the System of Reproduction; The Warfare between Different Species and its Relation to the Territory; The Relation of the Territory to Migration.

In its series of 'Life Stories of Famous Men,' Messrs. Watts & Co. have published **Thomas Henry Huxley**, by his son, **Dr. Leonard Huxley** (120 pp., 2/- net.) The volume is remarkably well written, and gives a fascinating account of the work of one of our greatest naturalists, and is illustrated by photographs.

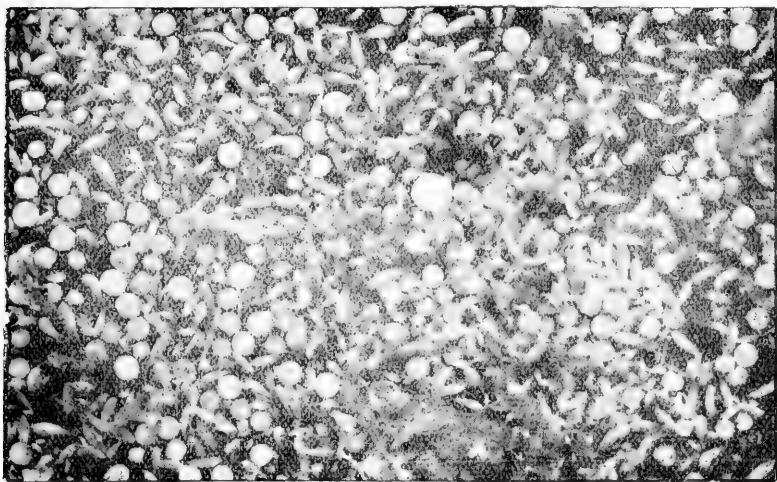
Messrs. Warne & Co. have issued the second volume of **T. A. Coward's** work on **The Birds of the British Isles and their Eggs**, which comprises the families *Anatidae* to *Tetraonidae* (376 pp., 12/6 net). There are no fewer than 213 coloured illustrations by A. Thorburn and others, as well as photographs by Kearton, and similar well-known Naturalists. The volume is even better than the first one, which was noticed in these pages a little while ago, and we can only add that for the money it is the very best work we know dealing with this subject.

A scientific work of welcome kind is **The Sea Shore**, one of the S.P.C.K. 'Nature Lovers' Series, written by **W. P. Pycraft**, of the British Museum (156 pp., 4/6 net). Mr. Pycraft deals with the subject in a way likely to interest the myriads of visitors to our watering places, and gives illustrations of the more remarkable forms of marine life likely to be met with, in addition to which he has remarks on the Past History of our Islands, the effect of Coast Erosion, Sand Dunes, and so on. The seven chapters are headed: The Gathering Together of the Waters; Concerning our Seas; The White Cliffs of England; The Inhabitants of Cliffs, Caves and Rock-pools; Pebbles and Sand-beaches; Where the River Weds the Sea, and Concerning Islands. We can recommend the book as a pleasant means of passing away some of the otherwise dull hours with which visitors to the seaside nowadays so frequently meet.

Secrets of Earth and Sea, by **Sir Ray Lankester** (243 pp., Methuen & Co., 8/6 net). This contains still further reprints of chapters written by Sir Ray Lankester in *The Field*, the *Illustrated London News* and the *Daily Telegraph*. The publishers claim that the author is second to none as an enthralling writer on Science. The chapters are of a quite miscellaneous character, and have the advantage of having been written by an expert who rarely finds pits and falls into them, though we don't mean to suggest that he is infallible. Among the twenty-two chapters in the present volume we have such subjects as The Earliest Picture in the World; Portraits of Mammoths, by men who saw them; The Art of Prehistoric Men; Vesuvius in Eruption; The Biggest Beast; What is meant by 'A Species'; Wheel Animalcules; The Swastika; Coal. In justice to Prof. Lankester, we ought to say that he seems to make no mention in his second chapter of an alleged carving of a mammoth found by one of his disciples (or masters?) in East Anglia.

It will be remembered that Professor Herdman, the President of the British Association, made an urgent appeal in his address at Cardiff for the thorough scientific investigation of the Seas surrounding Britain, and all that in them is. Bearing upon this important question is **The Sea Fisheries**, by **Dr. J. T. Jenkins** (London: Constable & Co., 300 pp., 24/- net). Next to the 'Challenger' Reports, and the reports of smaller

expeditions subsequently made, we know of nothing containing such a wealth of information bearing upon the British Sea Fisheries, from every possible point of view, as Dr. Jenkins' volume. It is, perhaps, surprising to learn from the title-page that the author is 'Of Gray's Inn, Barrister-at-Law,' as we usually look elsewhere for sound treatises bearing upon natural science. Dr. Jenkins has been fifteen years with the Lancashire and West Sea Fisheries Committee; he has a tremendous admiration for British fishermen, and has the ability to obtain information from all manner of sources and present them in a readable form. Not only is the natural history of Fishes dealt with, their migrations, and so on, but he describes methods of fishing, developments of Steam Trawling, Inshore Fisheries, Shellfish Fisheries, Scientific Research, and so on; and, of course, Legislation and Sea Fisheries. The volume



Plankton containing Fish Eggs. The large egg is that of a Plaice; the smaller ones are Cod and Whiting. The Copopod is that of a Calanus.

should have a large sale, not only among naturalists, but among business men at our Fishing Ports.

The Cardiff Naturalists Society is to be congratulated on the publication of the elaborate and detailed pamphlet entitled **Instructions to Collectors** (36 pp.), which has been issued in connection with their Faunistic Survey of Glamorgan. It is the work of the referees of the various groups, and gives sound advice on methods of collecting and preserving the various forms of animal and plant life to be met with in any particular area. The volume should appeal to collectors anywhere, and we can strongly recommend it. It can be obtained in quantities up to 500 at 6d. each, which, we should imagine, is much less than the actual cost, and we would suggest that many of our Societies which are now unable to publish reports on account of the increased cost of printing, might do well to purchase a number of these for distribution among the members.

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The late John Gerard has left his collection of coal fossils, birds and eggs, as well as his scientific books, to the Wigan Mining College. He had previously given specimens to the Manchester and British Museums.

YORKSHIRE NATURALISTS' UNION.

ENTOMOLOGICAL SECTION.

ON October 30th, well attended meetings of this section were held in the Institute, Leeds, Mr. G. T. Porritt presiding. Although the past wet season had generally been disastrous for insects, much useful work was reported.

After the election of officers, the following were exhibited :—

Coleoptera, etc.—Mr. W. J. Fordham exhibited the Solitary Ant *Mutilla europaea*, ♀♀ from Ravenscar and a ♂ from Bournemouth, and the sawfly *Loderus gilvipes* from Lancashire, new to Britain (see E.M.M.). BEETLES—*Plagiathrina fordhamiana* Keys. from Bubwith; *Saperda populnea* and *Phytodecta rufipes* from Martin Beck Wood; *Stenostola ferrea* from Edlington (H. D. Smart); *Ptinus tectus* from bird seed at Selby and *Pachyta cerambyciformis* from Wharnccliffe. Exhibited by Mr. H. H. Corbett: *Cassida nobilis* and *Cryptocephalus fulvus* from Doncaster district. Exhibited by Master Kitchen: various *Necrophori* (burying beetles) from Leeds district. Exhibited by Master Caird: a box of *Chrysomelidae* from the Leeds district. Exhibited by Master Hincks: several beetles from Leeds district, including *Rhynchites nanus*, *Limoniinus minutus*, *Silpha sinuata* and *Necrobia ruficollis*.

Hymenoptera.—Mr. A. E. Bradley showed males of *Bombus lucorum* Sm. taken in Littondale during August. In these males the face was black and the coloration generally of the female type. Hitherto Mr. Bradley had only taken such dark males very rarely and as isolated examples, but on the high *Callunæ* moors above Litton he found them in great numbers and apparently replacing the common form altogether. He also brought from the neighbourhood of Leeds a series of the males of *Psithyrus campestris* which ranged in colour from almost entirely yellow to entirely black; 'yellow-tailed' and also extremely dark forms of the males of both *Ps. distinctus* and *Ps. quadricolor*; and a queen of *Vespa rufa* which had the dark markings of the abdomen so extended as to produce a broad black band on each segment.

Mr. Rosse Butterfield showed specimens of most of the *Andrenas* found in Britain.

In reporting some observations made upon bees and wasps during the past season, Mr. Bradley mentioned that the female of *Andrena lapponica* Zett. does not, as has been supposed hitherto, gather pollen only from the flowers of *Vaccinium*. In some of the northern suburbs of Leeds, from which most or all of the bilberry has now disappeared, *A. lapponica* is still fairly common, and three females were taken early last June on the capitula of the Cat's-Ear (*Hypochaeris radicata*), the scopa and floccus of each bee being more or less charged with the pollen of that plant. Shortly afterwards, several bees, taken in various parts of the same district, were found to be carrying pollen apparently identical with that of the Cat's-Ear. Farther out from Leeds, where bilberry is common, as at Adel, the *lapponica* females do appear to confine themselves to the flowers of the last-named plant.

At the end of August and in early September, *old* queen bumble-bees, usually very faded and ragged, were frequently to be seen gathering pollen from Scabious and other flowers. In a normal season, such queens do not, as a rule, stir from the nest after the early months of summer, and one may suppose these individuals to have come from nests where the brood of 'workers' had failed or starved, partially or entirely.

Alluding to the new county record for *Ammophila sabulosa*, reported at the last Annual Meeting as having been taken at Spurn by Mr. Cheetham, Mr. Bradley stated that he had found amongst the late W. D. Roebuck's collection a specimen of this species taken at Strensall Common near York; in 1909, by the late Mr. W. Hewett.

Lepidoptera.—Exhibited by Mr. Porritt: a rayed form of *Melanippe hastata* from Honley, nr. Huddersfield; *Aplasta ononaria* from Folkstone,

and *Abraxas grossulariata* vars. *gloriosa* and *iochalca*. By Dr. H. D. Smart: *Thecla betulae* ab. *spinosa* and pale *Luperina testacea* from South Devon; dark *Bryophila perla* from Shelley; a series of *Syrichthus malvae* approaching ab. *taras* and a variable series of *Vanessa urticae*, *Polyommatus phlaeas* and *Eugonia quercinaria*; and specimens of *Macrogaster castaneae* from Wicken. By Dr. Croft: *Colias edusa* from South Devon, a series of *Odontopera bidentata* showing extreme variation, from near Leeds; and the continental 'Map' butterfly *Araschnia levana* and its variations *prorsa* and *porina*. By Mr. H. H. Corbett: a case showing specimens of *Asphalia flavicornis* and *Hybernia leucophaearia* resting on birch bark, also the following species taken in the Doncaster district during the past season—*Zeuzera pyrina*, *Asteroscopus sphinx*, *Phigalia pilosaria*, *Hybernia defoliaria*, *Scoparia angustea*, *Herbula cespitalis*, *Oxyptilus teucii*, *Tortrix unifasciana*, *Amphysa prodroman*, a *Carpocapsa splendidana*, *Adela rufimitrella* var. *maculata*. By Mr. Edward Cocker: a fine series of *Arctia caia* from Huddersfield district, including a remarkable creamy suffused specimen. By Mr. B. Morley: a long series of *Calymnia affinis* from near Doncaster, where the race is exceptionally large and variable, including almost black forms. For comparison were shown specimens from Cambridgeshire, Kent and Berkshire, where the species is small and pale coloured.

Diptera.—Mr. C. A. Cheetham showed a case containing most of the known Yorkshire mosquitoes and a number of their larvæ mounted in slides. Amongst the flies shown by Mr. Morley was a specimen of *Gymnochaeta viridis* new to the county lists and a specimen of *Xylophagus ater*, both from Skelmanthorpe.

Mr. W. Falconer passed round various kinds of foliage bearing galls of many kinds, both of bees, midges and mites, and also a few leaves scabbed with mildew. He appealed to the members to send him any galls they may come across and thus help forward the work yet to be done with the galls of the county.—B. MORLEY.

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YORKSHIRE NATURALISTS AT BRADFORD.

By the kind and joint invitation of the Bradford Natural History and Microscopical Society and Bradford Scientific Association, the fifty-ninth Annual Meeting of the Union was held in the large Lecture Hall of the Church Institute, Bradford, on Saturday, December 4th last.

The party who assembled in the morning spent an interesting time under the guidance of Mr. W. P. Winter, B.Sc., and Mr. E. Hepworth, B.Sc., in examining the geology of Chellow Dene and the neighbourhood of Nab Wood, Shipley.

The Meeting of the General Committee held in the afternoon was well attended, 28 of the 34 affiliated Societies being represented. After the formal adoption of the Report and Balance Sheet, the latter showing a satisfactory gain on the year's working, the Chairman, Mr. G. T. Porritt, announced that the Executive had offered to Mr. H. H. Corbett, M.R.C.S., F.L.S., of Doncaster, the presidency of the Union for the ensuing year. Great satisfaction was voiced upon learning that Mr. Corbett had signified acceptance of the office. Upon the invitation of Mr. Thomas Sheppard, M.Sc., it was decided to hold the Annual Meeting at Hull, in December, 1921. In order to meet the increased cost in the publication of *The Naturalist* it was unanimously resolved on the motion of Prof. P. F. Kendall, M.Sc., seconded by Mr. E. G. Bayford, that the necessary steps be taken, in accordance with the Rules, to increase the annual membership subscription from 12/6 to 15/-, and that the qualification for Life Membership should be a donation of not less than eleven guineas, such increased subscriptions to date from 1st January, 1921. The resignation of the

Secretaries (Dr. T. W. Woodhead, M.Sc., and Mr. W. E. L. Wattam) was received with regret, and they were instructed to place on record the hearty appreciation of the members of the Union for their services during the past nine years. No nominations having been received for the vacant Secretariate a small sub-committee was appointed to deal with the matter. The remainder of the officials were re-elected.

There was an excellent attendance at the evening meeting. After the election of nineteen new members, Prof. J. E. Marr, Sc.D., F.R.S., Camb., delivered his Presidential Address, 'Rigid North West Yorkshire,' from the Chair. This Address will appear in *The Naturalist*. The motion of thanks to Prof. Marr for his address, and for his services during the year, was moved by Prof. Kendall, seconded by Dr. A. Gilligan, B.Sc., and heartily carried. Thanks were also accorded to the inviting Societies for making the local arrangements.

At the close of this meeting the members proceeded to the Cartwright Hall, and were there received by the Lord Mayor, Lieut.-Col. A. Gadie, and the Mayoress. Afterwards a pleasant and instructive time was spent in admiring the works of art, and varied natural history exhibits.—W.E.L.W.

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Migration of Tree Creepers at Scarborough.—On November 23rd, a considerable migration of Tree Creepers appeared in the early morning at Scarborough, the Ramsdale Valley in the centre of the town, and surrounding gardens, being full of them. Six were counted running up the trunk of the same tree. All had passed on by afternoon of the same day.—W. J. CLARKE, F.Z.S., Scarborough.

Unusual Birds at Selby.—*The Yorkshire Evening News* of November 3rd reported the shooting of a Greenshank at Selby. Inquiries through Mr. Musham revealed the fact that this bird was a Knot, a fairly common winter visitor. Mr. Musham also reports that a Red-throated Diver flew into a yard in Armoury Road, Selby, during the evening of November 9th, and killed itself. Mr. B. Hanley shot a solitary Snipe at Bubwith on November 1st.—R. FORTUNE.

Effect of Oil on Marine Life.—Owing to the great increase in the number of motor-propelled vessels, both large and small, considerable quantities of oil find their way into the sea, and in the near future are likely to have a very destructive effect upon the flora and fauna of the littoral zone. The heavy lubricating oil sinks and becomes incorporated with the sand and shingle of the shore, while the lighter petrol floats on the surface. A number of sea birds—Black-headed Gulls, one Herring Gull, Razorbills and Guillemots—have been picked up along the coast, dead or dying, their plumage being so saturated with oil that they are unable to fly or dive. Sedentary forms of rock pool organisms are dying, and the inshore fisheries are suffering in consequence, codling, coalfish and others haunting the inshore rocks being very scarce this year.—W. J. CLARKE, F.Z.S., Scarborough.

THE YORKSHIRE NATURALISTS' UNION'S FIFTY-NINTH ANNUAL REPORT FOR 1920.

(Presented at Bradford, 4th December, 1920).

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The Fifty-Eighth Annual Meeting was held at Doncaster on Saturday, December, 6th, 1919. A full report of this meeting appeared in *The Naturalist* for January, 1920. The Presidential address of Dr. W. G. Smith, B.Sc., entitled 'The Naturalist and the Gardener,' then delivered, appeared in the same journal for March, April, and May, 1920 (pp. 89-95, 129-132, 155-157).

The Field Meetings for the year have been six in number, viz. :— at Skipton (Easter week-end), Reeth (Whit week-end), Martin Beck Wood, near Doncaster, Kirkham Abbey, near York, Beverley (August Bank Holiday week-end), and Helmsley (Mycological meeting). In addition, the Marine Biology Committee held its Annual Meeting at Scarborough, in September; the Botanical Section met at Meltham, near Huddersfield on May 15th, and the Dipterists at Old Farnley, near Leeds, on August 21st. It is pleasing to record a considerable increase in the attendance at these meetings. The usual descriptive programmes were issued, and full reports of the meetings have appeared in *The Naturalist* (pp. 224, 324, 363 and 365). The Union has been considerably assisted in its work by the kindness of the landowners of the county granting permission to the members to visit their estates.

The Excursions for 1921 will be as follows :—

Yorks., S.E. South Cave (Easter week-end), March 26th to 28th.
 „ N.W. Dent (Whit week-end), May 14th to 16th. 163
 „ N.E. Redcar, Saturday, June 11th to 13th. 164
 „ S.W. Wentworth, Thursday, July 7th. 165
 „ Mid. W. York (Bank Holiday week-end), July 30th to August 1st.

Mycological Meeting at Castle Howard, in September.

Membership.—The efforts of the Executive towards increasing the membership have been satisfactory, but to a great extent this has been counteracted by the deaths and resignations. The membership now stands at 383, the following fifty new members having been elected during the year, viz. :—

Abbott, A., 2 Langdale Terrace, Headingley Lane, Leeds.
 Ashworth, John H., The Bungalow, 151 St. Andrew's Road South, St. Annes-on-Sea.
 Behrens, Harold J., Moorside, Ilkley.
 Behrens, Mrs. G. J., Moorside, Ilkley.
 Bennett, Chas. George, Jesmond House, Pateley Bridge.
 Bisat, Wm. S., 1 Selwyn Avenue, North Ferriby, Hull.
 Bladon, Frank M., The Hornbeams, Sutton-on-Hull.
 Brown, James M., B.Sc., F.L.S., F.C.S., 176 Carter Knowle Road, Sheffield.
 Browning, Miss D. M., B.Sc., 39 Grasmere Mount, Armley, Leeds.
 Bulman, Miss F. M., 15 Emerald Street, Saltburn-by-Sea.
 Chislett, Ralph, Larkspur, Broom Crescent, Rotherham.
 Elgee, F., F.G.S., Shirley, Rookwood Road, Nunthorpe, R.S.O.
 Ferguson, J. B. P., 1 Norwood Terrace, Headingley, Leeds.
 Ferrale, Edward L., Bank House, Penistone.

Firth, Harry, 45 Leeds Old Road, Bradford.
 Flintoff, Robert J., Gale, Cardigan Road, Bridlington.
 Grace, George, B.Sc., F.G.S., 23 Alexandra Crescent, Ilkley.
 Grainger, Miss J., Wood Nook, Slaithwaite.
 Haydock, Arthur, High Street, Settle.
 Henderson, John, Kettlewell, via Skipton.
 Hind, Miss Mildred, B.Sc., 31 Royal Avenue, Doncaster.
 Holder, F. W., 20 Hawesside Street, Southport.
 Illingworth, John L., Gowan Lea, Queen's Drive, Ilkley.
 Matthewman, S., 52 Belle Vue Road, Leeds.
 Milnsbridge Naturalists' Society, c/o Mr. J. Beaumont, 68 Stoney Lane, Leymoor Bottom, Longwood.
 Murphy, H. N., B.Sc., 3 Cromer Terrace, Leeds.
 Musgrave, E., B.Sc., 18 Lister Lane, Bradford.
 Parker, Theodore, A.R.S.I., F.R.H.S., 4 Brookfield Place, Leeds.
 Parkinson, Herbert, 52 Norton Lees Road, Meersbrook, Sheffield.
 Pearsall, W. H., M.Sc., F.L.S., Woodsley Terrace, Clarendon Road, Leeds.
 Pickering, G. F., Woodcroft, Horsforth, near Leeds.
 Phillips, Major G. W., 21 Lawn Road, Doncaster.
 Procter, C. F., 522 Holderness Road, Hull.
 Ridgeway, Miss, 4 Springfield Mount, Leeds.
 Roberts, T. N., 38 West Bank, Scarborough.
 Rudd, R. H., Brantwood, Great Horton, Bradford.
 Seaman, Fred, Kirkfield, Ben Rhydding.
 Schroeder, W. L., M.A., 40 Clifton Road, Halifax.
 Smith, A. Malins, Biological Department, Technical College, Bradford.
 Stewart, Prof. M. J., M.B., M.R.C.P., Medical School, Leeds.
 Stewart, Mrs., Medical School, Leeds.
 Tempest, Ewart V., D.S.O., 463 Idle Road, Bradford.
 Tempest, Mrs., 463 Idle Road, Bradford.
 Thorpe, John G., 12A South Parade, Doncaster.
 Wallis, H. H., M.A., 145 Wilmer Road, Heaton, Bradford.
 Walsh, George B., B.Sc., 41 Gladstone Street, Scarborough.
 Watson, Rev. C. H., The Vicarage, Masham, Yorks.
 Wilson, Miss A. G., Bulcote School, Thornboro', Leyburn.
 Wilson, Miss M., Bulcote School, Thornboro', Leyburn.
 Wilson, Miss Janet, 24 Milton Place, Halifax.

The Affiliated Societies are the same in number as last year, having an aggregate membership of 2645, as against 2324, an increase of 321 upon the previous year's figures; the total numerical strength of the Union is therefore 3028.

Obituary.—We regret to have to record the death of three Past Presidents of the Union, viz., The Right Hon. Lord Walsingham, Lieut.-Colonel Wheelton Hind, M.D., F.R.C.S., and Dr. J. G. Baker, F.R.S. In Memoriam notices to these gentlemen have appeared in *The Naturalist*.

The Divisional Secretaries have greatly facilitated the work of the General Secretaries, with the result that much expense has been saved in organising the Excursions.

General Committee.—The following has been elected a member of the General Permanent Committee of the Union, viz. :—

Mr. James Y. Granger, Bradford.

VERTEBRATE ZOOLOGY SECTION.

West Riding.—Mr. H. B. Booth writes :—Mr. F. Booth believes a few pairs of Lesser Black-backed Gulls nested on the 'moss' at the side of Malham Tarn. I took the matter up with the gamekeeper (Mr. A. Ward), who states that three nests, each containing three eggs, had been seen, and he had also seen the young birds. He thought half-a-dozen pairs had nested. The birds first came in 1919, when he believes some nested. Mr. W. H. Parkin reported in the summer of 1919 that he had seen a number of Lesser Black-backed Gulls near Malham, and he believed they were nesting in the neighbourhood. This is a new nesting species for the West Riding, and is interesting in view of the curious nesting distribution of this species on the eastern side of England.

Mr. Haigh Lumby took me to see two gulleries of the Black-headed species of which we had no previous knowledge. They are in swamps three or four miles south of Clapham railway station, just past Keasden, and in the direction of Bowland Knotts. The first and larger one I carefully estimated at about 300 pairs. The smaller colony was about three-quarters of a mile to the east, and consisted of about 80 to 90 pairs of birds. From what we could learn they had been established some years. The local gamekeeper informed us there was a third, and still smaller, gullery further on in the direction of Bowland Knotts.

The Eshton Herons have again nested across at Lords Wood, and I hear between 20 and 30 were occupying nests this season. The small heronry at Hubberholme continues about the same—seven pairs having nested there this season (J. Henderson).

Ravens have greatly increased on the fells in the North-west of the Riding. On April 6th I spent several hours at Gordale Scar. During most of that time two to half-a-dozen Ravens were in sight, yet I could not see any sign of a nest.

Magpies, almost unfortunately, still continue to increase, chiefly in the suburbs of some of our towns and villages. I have had many reports of numbers seen, the largest of which was by Mr. Geo. Priestman, who carefully counted thirty Magpies leaving one small tree between Ilkley and Addingham in January, 1920.

A Great Crested Gebe frequented Malham Tarn during September, and was still there on the 24th of that month (A. Ward). A pair of Bramblings roosted nightly during March in a tall shrub in Saltaire Park (W. H. Parkin), and a late bird of this species was seen near Denholme on April 15th (I. Colledge).

An early nest of the Waterhen, with seven eggs, on January 17th, in Lister Park, Bradford, was reported by Mr. Malone. The nesting season of 1920 was cold, wet, and late; most probably with poor results. In game birds in this Riding, Red Grouse have done a little better than in the very bad season of last year, and Partridges and Pheasants much worse. About the 1st of October many young Pheasants here were little more than half-grown.

East Riding.—Mr. E. W. Wade writes :—An open winter, followed by a wet spring, brought on the early breeding birds. Peewits were nesting freely by mid March. On warren land eggs were laid during that month, but in Holderness clays the early nests were washed out by heavy rain, and laying was delayed till the second week of April. The Corvidæ were well to the fore in nesting, as is usual in an open wet spring. Many clutches of five and six Rooks' eggs were seen by the end of March, and in one nest were 10 eggs, evidently the produce of two birds, as the nest was well flattened out. During 40 years' experience of Rooks' nesting habits the writer has never seen such a thing before.

The Magpie, unfortunately, has made good in Holderness. On

5th April six new nests were seen between Patrington and Easington, where the bird had been exterminated before the war.

The breeding of the Brown Owl has been resumed after last season's miss, but clutches of two and three only were observed. The White Owl has hardly bred at all, but Long-eared Owls have been normal, though late in laying.

Snipe had laid before March was out, and four pairs of Shoveler frequented some low-lying land, converted into a marsh all the spring, being seen later on with young broods. I have only one previous record of such an occurrence.

The migrants arrived about the average date. Swallows, House and Sand Martins were very much below the 1919 numbers; Spotted Flycatchers and Redstarts above the average numbers.

Breeding of the Warblers was generally seven to ten days later than the average, and some very late nests were seen.

The Goldfinch again shows a satisfactory increase in the East Riding. Whinchats are scarcer than in 1918-1919.

The Turtle Dove is extending its breeding range. Three Corncrakes were heard in Holderness, and but eight round the foothills of the Wolds. The bird shows a still further decrease.

A Woodwren was sitting on four eggs in Burton Constable Woods on 26th June. It has always been an occasional visitor to this part of the Riding, but this is the first record of its breeding there.

The abnormal migration of Woodcock, in November, 1919, was followed by a record bag at Burton Constable, where 198 birds were secured November-March, the highest number ever shot in one season.

The Goldcrest has again established itself as a breeding species in Holderness, and has been seen in Howdenshire. Evidently our overseas migrants have become residents.

The Little Owl was seen on 18th April near Keyingham, and during the summer near Leconfield.

The Tufted Duck and Dipper again bred in the Riding, and a pair of Grey Wagtails was seen, but no nest was observed.

On 23rd November, 1919, a small party of Crossbills was seen at North Ferriby, and on 21st January, 1920, one out of a flock of about twelve was shot near Brough.

On 18th January, 1920, a flock of Snow Buntings was recorded at Bridlington.

Pheasants are showing the effects of underfeeding, and on some estates the young birds are dwindling. Partridges started nesting early, with a strong breeding stock, and hatched well, but the wet cold July and August left very few alive out of what were strong coveys to start with.

Pink-footed Geese arrived on the Wolds on September 22nd.

The bird perches on Spurn lighthouse have been re-erected.

On 30th July the East Riding County Council decided to apply to the Home Secretary for orders to protect the Peewit all the year round, and to prohibit the taking of eggs after 15th April. The orders have since been granted.

There is no change to report in the status of the Stone Curlew in the protected area at Warton.

North Riding.—Mr. W. J. Clarke writes :—Most species of birds are fully equal in numbers to those of previous years, and some are increasing.

The abundance of Tawny Owls and Goldfinches continues, and the former is now becoming a very common bird. Complaints of the ravages of bird catchers among the Goldfinches are received from two observers in the Whitby district.

Tree Creepers, Golden Crested Wrens, and Longtailed Tits are regaining their numbers, and are again up to the standard of 1916-17.

The Turtle Dove has also been more common this year, while Magpies

have been much more numerous. Landrails and Whinchats slightly increased in the Scarborough district, but the former is reported as less common near Whitby.

Swallows, House Martins, and Swifts were normal in the Scarborough and some other districts, but were less numerous than usual in the Whitby area.

Quails were present in two districts, and nested in one of them.

Details of a flock of upwards of twenty Siskins, a Waxwing, and a Grey Shrike, in the Whitby district, were published in *The Naturalist* for May, 1920.

Upwards of 100 Coots visited the Scarboro' Mere in the early spring, but owing to disturbance from boats on the water, only two pairs remained to nest. Both reared their young. No Little Grebes nested on this water during the present year.

A pair of Merlins tried to nest on the Moors north of Scarborough, but as usual both clutches of eggs were taken by a local collector.

A Hen Harrier was shot in the Whitby district, but precise details are lacking.

A pair of Teal, in the act of copulation, was seen upon Foul Syke on the first Sunday in May. Six weeks later a family party of seven was seen there, the majority of which were obviously young birds, pointing to their having been bred there.

Redshanks are extending their range as a breeding species in the North Riding.

Herring Gulls are also establishing new nesting colonies in the cliffs south of Scarborough. It has just come to light that in 1917 a pair of these birds nested in the midst of the Black-headed Gulls at Foul Syke.

Cormorants are numerous—too numerous—along the coast. The number nesting at the Peak is stated to have practically doubled during the last three years.

The recorder is indebted to Messrs. T. N. Roberts, A. E. Peck, and A. T. Wallis, of Scarborough, and to Mr. F. Snowdon, and Rev. A. M. Bolland of the Whitby District, for information used in compiling this report.

York District.—Mr. S. H. Smith writes:—The wet and stormy season has had a most disastrous effect on most of the local nesting species, and particularly game birds. Migrants, in nothing like their ordinary numbers, were late in arriving in their usual summer haunts. Whinchats appear to be increasing, and there was a noticeable increase amongst Landrails, this latter being specially significant in view of previous reports as to steady decreases. I am indebted to Mr. V. G. F. Zimmermann for valuable assistance in compiling the report.

1920.

Jan. 20.—A Blackbird's nest containing three eggs was built in a greenhouse on Bishopthorpe Road, York; these birds have nested in the same place since 1916.

Feb. 1.—A pair of Pochard and several Shoveler are frequenting the brickponds at Dringhouses, York.

„ 13.—Rooks commenced building nests in an ash tree at Monkgate, York. On the 23rd they began to build in the old rookery at Heworth, York.

Mar. 14.—A large flock of Golden Plover on Bootham Stray, York.

„ 16.—Two skeins of Pink-footed Geese passed over Dringhouses, York, flying west.

„ 21.—Several Hooded Crows were observed at Strensall.

April 13.—A large flock of Brambling Finches at Dringhouses.

„ 23.—*The York Evening Press* reports that 'A little Grebe broke the metal top cone of a signal post at Selby station by collision when flying at night.'

- May 8.—Nest and four eggs of the Curlew found at Skipwith, the parent birds were successfully photographed, and the eggs hatched out on the 20th, the young eventually going away safely.
- „ 9.—Several small flocks of Meadow Pipits were observed on Clifton Ings, York.
- „ 21.—A pair of Redshanks was seen in a meadow at Grimston, near York ; a very unusual district for this species.
- „ 23.—A Curlew's nest containing four eggs was found on Strensall Common.
- „ 24.—Cole Tit's nest, with young, in the ruins of Byland Abbey, and two pairs of Kestrels had their nests in Whitomcliff.
- June 2.—A pair of Curlew, two pairs of Redshanks, and three pairs of Nightjars were seen on Sandburn Common. A pair of Turtle Doves was carrying nesting material, and on the 9th the nest contained two eggs, both of which hatched in due course. A nest of the Bullfinch was found containing five eggs.
- „ 13.—A nest of the Garden Warbler, with five eggs, and that of a Lesser Whitethroat, with four eggs, were found at Strensall. A pair of Curlew with three strong young birds were also observed.
- „ 23.—A Meadow Pipit's nest, containing four eggs, and an egg of the Cuckoo, was found in Askham Bog.
- „ 27.—The Blackcap Warbler was observed at Strensall and a nest of five eggs was successfully hatched.
- July 14.—A pair of Great Crested Grebes, with two young ones, seen on the lake at Castle Howard. One nest of the Reed Warbler with five young ones, was found in the usual haunt by the lake side.
- July 22.—A Tree Creeper's nest, with four young ones, was found at Sand Hutton, York.
- Aug. 1.—Four Herons and a flock of sixty Mallard were seen on Strensall Common.
- „ 19.—Nineteen Pink-footed Geese flew over York at 7 p.m., travelling south-west. The evening was clear and calm. The following day the weather changed to very stormy, and heavy floods and storms are reported to have taken place in Scotland.
- „ 18.—Three parties of Sandpipers passed through York, one of four and two of five birds, all following the course of the River Ouse towards its mouth.
- „ 20.—Several more parties of Sandpipers proceeding down the River Ouse, all flying fearlessly through the City.

I have to thank Mr. F. Vear for his observations upon the Curlew at Skipwith, he further states that the Black-headed Gull is more numerous than ever in the well known haunt on Skipwith Common, many new nests being built on the ponds nearest to the main road. Other species that have more than held their own in point of numbers are Tawny and Barn Owls. Kingfishers are now a common feature in the bird life of the Rivers Ouse and Foss, at York, and locally there are hordes of Wood Pigeons.

Stockdoves are reported to be very common in a plantation at Bolton Percy, and Pied Flycatchers have nested at Newton Kyme for the past five years. Dippers have been very common in all their usual local haunts. Lapwings have fared well, and large flocks gathered together during September, and at the time of writing one favourite haunt of the species at Raskelf is crowded with larger numbers than have been seen for several years. There is also a 'stand' of Golden Plover of perhaps one hundred birds.

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mr. S. H. Smith writes :—This Committee has been re-organised, and it is hoped that members will put forth renewed efforts in making more complete the existing records for the county. All the early records cannot be traced, and if anyone possesses notes or books that should be in the hands of this Committee will they please communicate with the Convener. The most interesting item to report is the capture of a Barbestelle Bat (female) at Helmsley. (See Mr. Booth's note in *The Naturalist* for December). Mr. H. B. Booth reports that four Foxes (two old and two cubs) and a Badger were taken at Bransley Falls, four or five miles from the centre of Leeds, by two men in one morning (*vide Yorkshire Post* of October 12th, 1920). Badgers are increasing in numbers in Upper Wharfedale. (See report of Yorkshire Naturalists' Union excursion to Skipton.) All the known Badger colonies appear to be in a thriving condition. This is due mainly to the kindly preservation by friendly landowners. At the Kirkham excursion it was stated that two old established colonies were still in a very healthy condition. The same species has fared well at Kilnwick Percy, Allerton Park and Acaster, five being observed at the latter place, and I believe that two were killed by hounds.

Mr. W. H. St. Quintin reports that a male Pine Marten was trapped on June 1st at Barmston, six miles south of Bridlington, by Geo. Allison, gamekeeper to Mrs. Wickham-Boynton.

Otters are common in all their usual haunts. Mr. E. W. Taylor informs me that Mr. C. F. Procter and he saw a Pipistrelle Bat flying over a pond at North Cave on December 12th, 1919, between two and four p.m., the weather was very mild at the time, and may account for the unusual appearance of this species in the depth of winter.

Mr. F. Vear reports that Viper's have been exceedingly numerous on Skipwith Common this year, more being killed than for many past years.

Grass Snakes appear to be steadily increasing and extending their range in Holderness, chiefly along the course of the agricultural drains in the neighbourhood of Kelsey Hill, which appears to be the centre of their distribution. The Palmated Newt appears to be a steadily decreasing species.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Mr. Johnson Wilkinson writes :—

Green Plovers.—It is satisfactory to know the East Riding County Council has passed an order similar to that of the West Riding County Council for the protection all the year for both birds and eggs. The following County Boroughs have likewise applied for an order, viz. :—Barnsley, Bradford, Dewsbury, Sheffield and Wakefield.

North Riding.—Young Falcons have again hatched and flown.

Bempton.—Climbers have had a good season. No Falcons have laid this year. Fulmars again visited the Cliffs, but no eggs have been seen.

Hornsea Mere.—Unfortunately four dead Grebes (starved specimens) were picked up during the month of June, but many young Grebes got away. Tufted Ducks and Pochards about as usual.

Spurn.—Unfortunately a very large tide and heavy seas during the month of June washed away a number of eggs between Chalk Bank and Spurn. The Terns, however, laid again on the same ground and reared their young safely. Posters had to be put up in prominent places for protection ; afterwards there were no complaints of any sort.

Stone Curlews.—Very satisfactory year for hatching ; many young birds seen, but not many nests found.

BALANCE SHEET.

RECEIPTS.				EXPENSES.			
	£	s.	d.		£	s.	d.
Cash in hand ...	...	11	1 2	Coates and Bairstow ...	...	1	7 6
Mr. Albert Hirst ...	...	10	0 0	Advertiser Press ...	...	0	18 3
Mr. St. Quintin ...	...	5	0 0	Spurn ...	...	20	0 0
Mr. F. W. Dent ...	...	2	2 0	Hornsea Mere ...	...	6	0 0
Mr. L. Gaunt ...	...	2	2 0	Sedbergh ...	...	3	0 0
Mr. O. F. Saner ...	...	2	2 0	Stone Curlews, etc. ...	...	2	10 0
Mr. H. B. Booth ...	...	1	1 0	Bempton ...	...	1	0 0
Dr. Bishop ...	...	1	1 0	Balance in hand ...	...	12	15 5
Mr. F. H. Edmondson ...	...	1	1 0				
Sir W. Garforth ...	...	1	1 0				
Mr. J. Wilkinson ...	...	1	1 0				
Mr. J. Atkinson ...	...	1	0 0				
Mr. J. Y. Granger ...	...	1	0 0				
Miss Waterhouse ...	...	1	0 0				
Mr. J. H. Behrens ...	...	0	10 6				
Mr. W. N. Cheesman ...	...	0	10 6				
Mr. E. B. Gibson ...	...	0	10 6				
Mr. F. Haxby ...	...	0	10 6				
Mr. A. H. Lumby ...	...	0	10 6				
Mr. C. W. Mason ...	...	0	10 6				
Mr. J. F. Musham ...	...	0	10 6				
Mr. W. H. Parkin ...	...	0	10 6				
Mr. E. W. Wade ...	...	0	10 6				
Mr. G. T. Porritt ...	...	0	10 0				
Mr. S. H. Smith ...	...	0	10 0				
Mr. E. Cockshaw ...	...	0	5 0				
Mr. G. Fysher ...	...	0	5 0				
Mr. E. W. Taylor ...	...	0	5 0				
Mr. H. E. Wroot ...	...	0	5 0				
Bank Interest ...	...	0	4 6				
	£47	11	2		£47	11	2

Audited and found correct,

W. É. L. WATTAM,

22nd September, 1920.

MARINE BIOLOGY COMMITTEE.

Mr. A. I. Burnley writes :—The members met at Scarborough from August 28th to August 31st, during which time a visit was also paid to Filey. A full report appeared in *The Naturalist* for November, pp. 363-364, to which reference should be made for details. The meeting was most successful.

CONCHOLOGICAL SECTION.

East Riding.—Mr. J. F. Musham writes :—Bordering on Selby, the common species have been noticed in their usual haunts, while in the extreme south-west corner of the Riding, the demands of commerce have now entirely wiped out what was once a prolific area for many species.

ENTOMOLOGICAL SECTION.

Lepidoptera.—Mr. B. Morley writes :—The past season has been one of the worst on record. During the mid-season months, especially, scarcely a moth or butterfly was to be seen. Even the three species of white butterflies have been rare in the West Riding. There was, however, a great abundance of spring moths in January, which month, strange to say, was more prolific than any succeeding month. The Rev. C. D. Ash found a colony of *Nonagria arundineta* Schmidt. in Lower Wharfedale, where both the type form and the melanic variety *dissoluta* occurred. Mr. Ash also reports two specimens of *Agrotis praecox* from an inland locality near Holme-on-Spalding Moor. On May 14th, near Staithes, Mr. T. Ashton Lofthouse took two specimens of *Anesychia funerella*, of which there is only one previous Yorkshire record. Near Skelmanthorpe I have taken *Heliacea tenebrata*, *Apamea leucostigma* and *Peronea aspersana* new to the local list. *Plusia moneta* has extended its range to Meltham, Grassington, Driffield and Scarborough. *Acherontia atropos* has also been taken at Meltham. Mr. W. E. L. Wattam bred specimens of *Cucullia verbasci* from larvæ found at Newsome, and also noted many larvæ at Kirkham Abbey in July. Mr. G. T. Porritt noted the latter species at Huddersfield again, near which town he also found the larvæ of *Sciaphila sinuana* abundantly. An immigration in spring of *Vanessa atalanta*, *V. cardui* and *Plusia gamma* occurred, but the Vanessids have only been scarce in comparison with what was expected, while *gamma*, on the other hand, produced an exceptionally numerous autumn brood. Mr. Porritt took a pretty variety of *Melanippe hastata* in Honley Wood, near Huddersfield, where the species was fairly common. *Abraxas grossulariata* seems to have practically disappeared from the gardens of the West Riding during the past two years.

Mr. H. H. Corbett adds :—A very mild winter was remarkable for the abundance of some species and the early appearance of others. From November to January *Hybernia defoliaria* was extremely plentiful and varied. It was no uncommon sight to see thirty or forty females on the trunk of one tree. *Himera pennaria* was also remarkably abundant ; on one occasion I counted sixteen females on one oak trunk. On the other hand, *Hybernia avarantaria* and *Cheimatobia brumata* were quite scarce, and those that did put in an appearance were usually dwarfed. *Phigalia pendaria* appeared on December 9th, 1919, and by the new year was abundant. *Asphalia flavicornis* appeared on March 4th and was fairly common, while *Epigraphia avellanella* was extremely rare. Mild weather continuing until the middle of April the young larvæ of the 'winter' moths came out in countless numbers, and there was every appearance of a caterpillar plague. A series of frosts, gales and heavy rains in May withered young leaves and destroyed millions of larvæ. From that time, throughout the year, collecting has been a hopeless quest. The only species that I have seen in normal numbers are *Plusia gamma*, *Tortrix viridana* and *Pyrameis atalanta*.

Notwithstanding the bad season, I have had the good fortune to add two species and one variety to the County list. These are *Carpocapsa splendana* of which I took one at Doncaster in August ; *Adela rufimirella* var. *maculata*, one at Askn in June ; and *Oxyptilus teucii* that I found fairly common at Hatfield.

Coleoptera.—Dr. W. J. Fordham writes :—The general experience of the Committee has been that the past season has been one of the worst on record. The number of species observed, and even beetles which are usually accounted extremely abundant, have appeared in much depleted numbers. There are a few unexplained exceptions to the above generalisation, and a full account will appear as usual in *The Naturalist* when the material acquired has been fully worked out and verified. A few additions have been made to the County list, not the least interesting

being the capture, near Hull, by Messrs T. Stainforth and G. B. Walsh, of *Dytiscus circumflexus* F. in fair numbers.

Hymenoptera.—Mr. R. Butterfield writes :—The outstanding feature with regard to this section is the discovery, in March, of considerable numbers of the small bee, *Andrena ruficornis* Nyl. at Adel, near Leeds, by Mr. A. E. Bradley. Its burrows had not been previously found in Britain, and only a few examples of the bees had been taken, recorded from Scotland, and a few said to be from Yorkshire, obtained 75 years ago. These are in the possession of Dr. R. C. L. Perkins, but no particulars are known.

The season has been very disappointing, even the hardy social bees and wasps have been few in numbers. During the fine weather, in March, the early bees were abundant, and *Andrena gwynana* K. and *A. nigroænea* K. were common in places. Mr. A. E. Bradley has made some interesting observations as to the relationship of some of the species of *Andrena* to the inquilines of the Genus *Nomada*. He has found *Nomada fabriciana* associated with *Andrena angustior* at Adel. The only new bee that I have to record is *Andrena subopaca* Nyl., from Keighley and Grassington. I captured a specimen of *Megachile circumcincta* Lep., near Bingley, in June. I have not previously seen any of the leaf-cutting species in the western hilly districts of Yorkshire.

There are a few additions to the Saw flies, including *Tenthredopsis excisa* Thom., *T. palmata* Geof., *T. tristior*, *Pachyprotasis variegata* Fall., and *Priophorus padi*.

Neuroptera and Trichoptera.—Mr. G. T. Porritt writes that very little appears to have been done in these orders. He found *Tinodes aureola* in plenty during July, about dripping rocks in Pennyspring Wood, Huddersfield, a species hitherto only recorded in the county from Hayburn Wyke. The local *Stenophylax vibex* also occurred at Dalton, Huddersfield. Dr. W. J. Fordham has sent for determination a number of species taken by himself, but they were received too late for incorporation in this report.

Diptera.—Mr. Chris. A. Cheetham reports.—During the year close on 300 additions have been made to the published Yorkshire diptera list, by looking over old collections and unpublished lists and by increased activity in the field ; many more will doubtless be added as the year's collections are worked over in the winter.

A notable feature has been the first sectional meeting under the leadership of our referee, Percy H. Grimshaw.

The summer has lacked the hot sunshine that some diptera delight in, good collecting days have been few. Many species which were fairly plentiful in 1919 have not been met with this year, especially Syrphidæ and other sun-loving groups ; those seen most frequently having aquatic larvæ (*Eristalis*, *Helophilus*, etc.), or semi-parasites like *Volucella bombylans* and *V. pellucida*.

Attention has been given to sweeping, and Acalypterate Muscidæ and Anthomyidæ seem fairly up to the average, but perhaps Dolichopodidæ were less numerous than usual.

Hemiptera.—Dr. W. J. Fordham writes :—Complete lists are not yet to hand. It is hoped that a preliminary list of Yorkshire species may shortly be published, to form a basis for future work, and an appeal is hereby made to all members of the Entomological Section to take any Hemiptera they may come across and forward them to one or other of the members of the Committee.

Arachnida.—Mr. W. Falconer writes :—Nothing new has been added, except amongst the mites, but eight kinds of spiders, new to V.C. 65, were recorded in the account of the Union Meeting at Reeth (*ante* August, pp. 254-5). Mr. W. P. Winter sent in three small collections, amongst which was one female, *Evansia merens* Cb., taken from a nest of the ant, *Myrmica ruginodes*, at Goitstock, V.C. 63, by Mr. Rosse Butterfield,

April, 1918. Two other spiders have not been recorded before for the Huddersfield district. Mr. A. Clarke found a female *Epeira cornuta* in his garden, and in Sun Dean, a fine male *Europhrys frontalis* Walck. was captured beneath a stone in June last. The latter is a rare spider in the western half of the county, there being only two previous records, viz., Bradford (Dr. Meade) and Linton Common, near Wetherby. The 'Spiders of Yorkshire,' begun in June, 1918, continues its serial publication in *The Naturalist*.

Good progress has been made in the investigation of the mite fauna, the distribution of many species being extended and others added to the list, so that now there are some 260 species to be recorded for the county. Mr. Winter contributes the names of those recently found in the Bradford area by Mr. F. Rhodes and himself. Acting on information received from the Rev. R. A. Taylor, now of Elland, I entered into communication with Mr. C. D. Soar, who very kindly supplied a valuable list of the water mites gathered by himself and Mr. Taylor in various parts of the county. The localisation of the latter's finds was obtained from the records of the Scarborough Field Naturalists' Society, per Mr. G. B. Walsh. Amongst the few I submitted later to Mr. Soar were four species new to the county, namely, V.C. 61., *Eylais infundibulifera* Koen., and *E. discreta* Koch, Barmston Drain, Hull (Mr. T. Stainforth); V.C. 63, *E. gigas* Pier. and *E. triarcuata* Pier, near Doncaster (the late Captain Corbett). With these, the total in this group is now 36. The names of 15 gall mites are included in 'Plant Galls from Wensleydale' (Jan., p. 30) and twelve from Swaledale in a forthcoming paper. A living tick, *Ixodes hexagonus* Leach, taken from a domestic cat (not its usual host) at Selby, was sent for identification by Mr. Cheesman in June. Although a common species in some places, it does not seem to have been recorded before for the county. The false-scorpion, *Chernes nodosus* Schr., as usual clinging to the legs of flies, has occurred in two successive years to an observant Huddersfield resident, and is the sixth of the eight Yorkshire species to be noted in the district. A momentous discovery at the Parasitology Laboratory of Aberdeen adds a mite new to science to the British list, viz., *Tarsonema woodii*, stated to be the cause of the fatal Isle of Wight disease, which has devastated countless hives of bees in Yorkshire as elsewhere.

BOTANICAL SECTION.

Mr. J. F. Robinson writes :—The resuscitation of floristic interest referred to appreciatively in the last two or three annual reports has well maintained itself, and, we believe, is even increasing in intensity. Many new and flourishing stations of several, not absolutely common, plants have been discovered, notably may be mentioned *Hypericum montanum*, *Spiraea Filipendula*, *Atropa Belladonna* (with much flower and fruit), *Campanula glomerata*, and *Verbascum Thapsus* on the chalk slopes of East Riding dales; *Statice Limonium* and *Hyoscyamus niger*, near the Humber Shore; and *Utricularia vulgaris*, with *Ceratophyllum demersum*, in old brickponds within the boundaries of the only E. Riding City.

As to the vegetative aspect, never have we noticed plants more rank and luxuriant than during the season 1920; flowering also, especially in the later part of the year, was tolerably profuse, but of fruiting generally perhaps the less said the better. Both wild and cultivated species of prunus have in many instances been a complete failure. Apple and Pear are a very little better, whilst Oak, Ash and Elm, which we said did only fairly well in 1919, are very much worse this year. The later flowering plants, e.g., the rubi (Raspberry, Bramble, etc.) have shown a very good average crop of good fruit.

Mr. C. A. Cheetham adds :—Many early flowers were seen in February,

viz., the two Daphnes, Celandine, Purple Saxifrage, Primrose and Violet; the promise of an early spring, but this was spoilt by the late frosts and cold, wet spells which followed. Some nice weather in May, however, brought Hawthorn into flower earlier than usual. It would be well carefully to consider the question of weather and insects in attempting to unravel the curious anomalies presented by the almost complete absence of fruit from a group containing Apple, Pear, Plum, Cherry, Ash, Elm and Oak, and a second group of those with abundant fruit like Beech, Sycamore, Elder, Rose, Bramble, Mountain Ash, and Hawthorn.

A carefully compiled weather report, month by month, summarized in the Union's Annual Report, would be a help in such enquiries.

There is need for careful consideration of all available facts; but part of the lack of fruit may be due to the extra effort of last year, and this is probably the cause of the partial absence of many of the Orchids. Entomologists quote the absence of bees when orchard fruit trees were in bloom, and insects generally have been adversely affected by the weather, pollination being consequently uncertain.

Botanical Survey Committee.—Mr. W. H. Burrell writes:—Notes have appeared in *The Naturalist* from time to time, and further work has been put in hand at Gormire and in Upper Wharfedale. The Study of Hagg Wood, near Huddersfield, has been continued, and has so far progressed that a report may be expected shortly from Mr. J. R. Simpson, who, we regret to learn, has recently left the county.

Mycology.—Mr. A. E. Peck writes:—At the Yorkshire Naturalists' Meeting at Skipton in May, the Mycological Committee was represented by Messrs. M. Malone and F. A. Mason. The meeting at Reeth in May, was attended by Messrs. J. Ackroyd, R. Fowler Jones and F. A. Mason. Messrs. J. Ackroyd, W. N. Cheesman, and F. A. Mason attended the meeting held at Martin Beck Wood, near Doncaster, on June 19th.

An illustrated article, entitled '*Mitrophora gigas* at Forge Valley, Scarborough,' by the writer, appeared in *The Naturalist* for July, 1920 (No. 762).

At the Yorkshire Naturalists' Meeting at Kirkham Abbey on July 10th, the Mycological Committee was represented by Messrs. R. Fowler Jones, F. A. Mason and A. E. Peck. See report in *The Naturalist* (No. 766).

The Meeting, at Beverley, July 31st-August 2nd, was attended by Messrs. R. Fowler Jones and A. E. Peck. Many species of Fungi were noted, particularly at Dalton Holme. See report in *The Naturalist*, December, No. 767.

The Annual Fungus Foray was held at Helmsley, September 11th-16th, and was well attended. For report with illustrations, by the writer, see *The Naturalist*, December (No. 767).

The Mycological Committee again has to deplore the loss of a member by death. On July 27th, Chas. H. Broadhead died in his 60th year. An article by the writer, with portrait, appears in *The Naturalist* for October, 1920 (No. 765).

GEOLOGICAL SECTION.

Mr. John Holmes writes:—The Section has been represented on all the long-date excursions. During Easter week the whole of the Carboniferous succession in the Skipton district was examined under the guidance of Dr. Wheelton Hind, who also demonstrated the zoning of the Pendleside Series by means of the Goniaticites, a valuable piece of work, which, unfortunately, proved to be the last of his numerous contributions to Yorkshire Geology.

Dr. Hind's loss is keenly felt by members of the Section, but the work on the Pendlesides and Millstone Grit is being continued, and preliminary reports by Mr. Bisat have appeared in *The Naturalist*. Mr. Butterfield's

work, *loc. cit.*, on the Red Conglomerates of the Sedbergh district, is also worthy of note.

A beginning has been made with the investigation of the Yorkshire Rivers and the Peat deposits of the County.

Jurassic Flora Committee.—Mr. J. J. Burton writes:—Intermittent and individual work has been done by several members during the past year, but there has been no collective work by the Committee.

Some fresh finds are frequently being obtained from workings in the oolitic sandstone of the Cleveland area, consisting chiefly of *Otozamites obtusus*, *Williamsonia pecten*, and *Williamsonia gigas*.

Some further work has been done at the Roseberry plant bed.

Mr. Hamshaw Thomas is working at Cambridge on some of the plants collected on the Yorkshire beds, but I am advised that there is nothing yet ready on which a report can be issued.

Yorkshire Glacial Committee.—Mr. J. W. Stather writes:—

Beverley.—On the occasion of the Union's visit to Beverley last August a very fine section of boulder clay was seen resting on chalk in Messrs. Storry and Witty's quarry south of the town. The bed, eighteen feet thick, was unusually clear for an inland exposure, the dividing line of silt between the Hessele clay (upper six feet) and the purple clay (lower twelve feet) being very noticable. For particulars see *The Naturalist* for December.

North Ferriby.—In connection with some extensive excavations on the Humber foreshore between North Ferriby and Brough, interesting sections in the glacial and late glacial series have been made. These have been carefully measured by Mr. W. S. Bisat, and details will be given in due course.

Coast Erosion Committee.—Mr. J. W. Stather writes:—

Holderness.—Severe erosion continues unabated on the Holderness coast. At Cowden, four miles south of Hornsea, the boulder clay cliffs are between seventy and eighty feet high. In 1902 a bungalow was erected there, and a stone was built into the wall with this inscription—"Manor Cars. Erected 71 yards from the cliff edge. G. W. Oldham, 1902." In October this year (1920) the distance of the house from the cliff edge was under twenty yards—showing a loss of fifty-one yards in eighteen years—an average loss of nearly three yards per annum.

Whitby.—Mr. J. T. Sewell, J.P., reports that during 1920 the inroads of the sea on the east side of the town have been more marked than usual, and along the Lias cliffs several new caves have appeared. On the other hand, the level shales forming the scar alter very little, as the cart ruts, made at least forty-five years ago by the collectors of cement doggers, can still be seen. On the west side of the town, between Upgang and Eastrow, there have been many minor falls of rock, and the path on the edge of the cliff has had to be set back.

Committee of Suggestions for Research Work.—Mr. Chris. A. Cheetham reports:—A start has been made on the two lines of work selected by this Committee at the meeting held in Leeds University in May. An exhibit was made at the Conference of Delegates at the British Association Meeting showing the work that is in progress.

The PEAT INVESTIGATION has been of a general type, and every opportunity has been taken to get a broad view of the problem.

Reports have been made in connection with the Union's excursions, and some local problems have been put before the Committee, with samples of peat; one by Mr. Leslie Armstrong from Broomhead Moor, Sheffield; where flint implements were seen on the old surface, and in the subsoil beneath four to six feet of peat; another by Mr. Nowers, from Darlington, where a thin deposit of peat was found below five to six feet of clay, and resting on deep clay. Here the recognisable remains were *Menyanthes* seeds, *Chara* spores and debris of *Hypnum scorpioides*.

On October 16th Prof. Kendall demonstrated the use of boring tools

in testing the depth and sampling the lower layers of peat, a report of this meeting occurs in *The Naturalist* (Nov., pp. 369-370).

Lectures on the subject are being arranged during the winter; the difficult but exceedingly useful work of bibliography, and the possible arrangement of a small library on Peat, is well in hand. Dr. Forsyth's report of people interviewed, and papers, etc., consulted, is very encouraging and hopeful.

The Rivers Investigation appears to have been confined to the examination of submerged mosses in various types of streams. It is hoped that a note on this subject may be published shortly in our journal.

British Association.—The representative of the Union (Mr. Thomas Sheppard, M.Sc.) attended the British Association meeting at Cardiff in the dual capacity of the Delegate from the Union and President of the Conference of Delegates, which met on two occasions. He took for the subject of his address, 'The Evolution of Topographical and Geological Maps,' which was printed in advance by the Association, and was distributed among the delegates. A brief reference to this address appeared in *The Naturalist* for October, pages 317-319. Originating from a suggestion made by your delegate, Mr. Gilbert D. Shepherd of the Cardiff Naturalists' Society, arranged an exhibition to illustrate the work of the Corresponding Societies, which was held in two rooms at the Technical College, where the Conference was held. This was quite successful, but in view of the prominent part which the Yorkshire Naturalists' Union has played in the scientific history of the country, its exhibits were disappointingly few, being confined to the president's extensive collection of geological maps, which occupied the large lecture hall; the Botanical Survey maps (original and published) by Drs. W. G. Smith and T. W. Woodhead; Yorkshire Syrphids, and specimens illustrating Peat Investigation, by Mr. C. A. Cheetham, and a case showing the variations in the Pale Brindled Beauty, by Mr. R. Butterfield. Through the kindness of Principal A. D. Trow, who provided tea for the delegates, an excellent opportunity was afforded for examining the various exhibits. However, as the British Association has been invited to visit Hull in 1922, possibly an opportunity will then be given for the Yorkshire Naturalists to show that they are capable of greater achievements than was evident at Cardiff.

The Naturalist.—The high standard of excellence of our journal has been maintained under the well directed energy of the Editors, and they are to be heartily congratulated on their continued success in keeping the Union's organ in the front rank of Natural History journals. Thanks are due to Mr. Thomas Sheppard, M.Sc., for supplying entirely free of cost blocks in illustration of his contributions, and to Mr. C. A. Cheetham for paying for the plate in the June number, and four extra pages in the July number of *The Naturalist*.

The Presidency of the Union for 1921 has been offered to and accepted by Dr. H. H. Corbett, M.R.C.S., F.L.S., Doncaster. The Union wishes to record its indebtedness to its retiring President, Prof. J. E. Marr, D.Sc., F.R.S.

Soppitt Memorial Library.—Dr. T. W. Woodhead, M.Sc., reports: The following contributions have been received:—

Notes from the Royal Botanic Garden, Edinburgh, Vol. X., Nos. 49-50, and Vol. XI., No. 51. Birmingham Natural History and Philosophical Society Annual Report for 1918 and list of members for 1919, and Proceedings, Vol. XIV., Part 3, 1919. North Staffordshire Field Club, Transactions and Annual Report, 1919-20. British Association Handbook, Cardiff Meeting, 1920. Bibliographical Contributions from the Lloyd Library, Vol. III., Nos. 2 to 7. 97th Report of the Whitby Literary and Philosophical Society for 1919.

NORTHERN NEWS.

The List of Members of the Yorkshire Naturalists' Union appearing in this number is printed through the kindness of a Past-President of the Union, Mr. W. N. Cheesman, J.P.

Mr. R. W. Goulding, F.S.A., favours us with 'Notes on Books and Pamphlets printed in Louth, 1801-1850,' which is a remarkable record for this comparatively small township, and speaks well for the industry of the compiler in gathering the various facts together.

Mr. Mark L. Sykes, whose papers on Lepidoptera are well known to Manchester and Leeds Naturalists, has presented a collection of over 2000 insects to the Leeds University, including some cases of gorgeous exotic butterflies, also specimens illustrating Mimicry, a subject Mr. Sykes has made his own.

The Transactions of the London Natural History Society, 1919 (45 pp., 3s.), besides the usual reports of the various sections, contains the Annual Report on the Birds of Epping Forest; the President's Address on 'Wing Colour in Butterflies and Moths,' and a paper by H. B. Williams on 'Parallelism in Variation in Butterflies.'

The editor of a contemporary, according to the leading article in the November issue, is not quite sure whether 'the character of a curate appears in "The Private Secretary" or in "Charley's Aunt."' We certainly think in the profound scientific discussions which occur in that journal, an important matter of this kind might at least have been verified.

The correspondence columns of the daily papers have recently contained articles dealing with Sun Temples and Bruanburgh Battles. Personally we should be grateful if the gentlemen who write about the sites of battlefields found in tunnels, and altars for bloody sacrifices on hill tops, would give us even a reasonable amount of evidence for the extraordinary theories which they propound.

The London Museum, St. James's, has issued a 'Guide to the Pre-historic Room' (11 pages, 3d.), which is rather different from the usual type of Museum Guides, inasmuch as it is a running lecture or talk on the various objects exhibited in this particular room, reference to the individual specimens being made by means of their numbers in parenthesis. The Guide is not broken up by references to cases or anything of that kind.

Dr. Marie Stopes, in Vol. XLIV. of the Linnean Society's Journal (Botany), describes in detail '*Bennettites Scottii* sp. nov., a European Petrification with Foliage.' Her paper is based on a specimen without any history, which was transferred from the Botanical department in 1898 to the Geological department of the British Museum. This species has been carefully sliced, and an interesting description of the plant structure has been described as a result.

Vol. LXIII. of *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, 1918-19, contains five valuable memoirs, four of which are of particular interest to our readers, though the first three were published separately during 1919. :—'The Herbarium of John Dalton,' by R. S. Adamson and A. McK. Crabtree; 'The Ancient Legend as to the Hedgehog carrying Fruits upon its Spines,' by M. Christy; 'On a New Middle Carboniferous Nautiloid,' by J. W. Jackson; 'Henry Wilde,' by Prof. W. W. Haldane Gee.

Referring to our notes in the last issue, we learn from the daily press that 'Clement Edwards, M.P., is very proud of the prehistoric flint which he found while on holiday in Berkshire. It contains, he claims, 83 different carvings upon it, done some time in the Palæolithic Age. He is always finding a new one. It proves that there were Epsteins even when we wore skins. Mr. Edwards keeps it in the members' cloakroom, and brings it out to be admired whenever you like.' From this it seems clear that he *does* think the flint is the work of Palæolithic Man!

YORKSHIRE NATURALISTS' UNION.

LIST OF MEMBERS.

CORRECTED TO JANUARY, 1921.

The Members whose names are printed in italic type are *Permanent Members of the General Committee*. The dates preceding names are those of election; Original Members, being those elected previous to 1883, are marked —; those to whom L. is prefixed are Life Members, by virtue of a donation of not less than seven guineas; those to whom H.L. is prefixed are Honorary Life Members; P.=Past-Presidents; E.=Members of the Executive; C.=Presidents or Secretaries of Committees.

Members changing their addresses are requested to inform the Secretaries as soon as possible. Those to whom an asterisk (*) is prefixed do not receive *The Naturalist*.

- 1920 ... ABBOTT, A., 2 Langdale Terrace, Headingley Lane, Leeds.
 1905 L. ACKROYD, J., West View, 101 Dark Lane, Batley.
 1919 ... ADAMSON, R. S., M.A., B.Sc., The University, Manchester.
 1909 ... ARMSTRONG, A. L., 14 Swaledale Road, Millhouses, Sheffield.
 1894 ... Ash, Rev. C. D., M.A., Saxton Vicarage, Tadcaster.
 1920 ... ASHWORTH, JOHN H., The Bungalow, 151 St. Andrew's Road South, St. Annes-on-Sea.
 1910 ... ASSHETON, Mrs. M. N., Whitebeams, Upper Hardres, Canterbury.
 1907 ... Atkinson, J., 33 St. Michael's Road, Headingley, Leeds.
 1911 ... ATKINSON, Miss CONSTANCE, 3 Woodland Grove, Chapeltown Road, Leeds.
 1897 ... Audas, Thos., L.D.S., "Taematon," Cardigan Road Bridlington.
 1911 ... BAGSHAW, W., J.P., F.R.M.S., 17 Hereford Road, Harrogate.
 1893 ... Barker, K. H., May Lodge, Filey Road, Scarborough.
 1915 L. BARKER, W. R., 64 Grove Street, Barnsley.
 1908 ... BARRY, J. W., J.P., Fyling Hall, Robin Hood's Bay.
 1919 ... BATES, Miss WINIFRED M., 35 Armitage Road, Birkby, Huddersfield.
 1889 ... Bayford, E. G., F.E.S., 38 Eldon Street, Barnsley.
 1893 ... BEAN, EUGENE, Hinderwell House, Falsgrave Road, Scarborough.
 1913 E. Beanland, Jo., 55 Oulton Terrace, Horton Road, Bradford.
 — ... Bedford, J. E., F.G.S., Arncliffe, Shireoaks Road, Headingley, Leeds.
 1920 ... BEHRENS, HAROLD J., "Moorside," Ilkley.
 1920 ... BEHRENS, Mrs. G. J., "Moorside," Ilkley.
 1907 ... BELLERBY, W., 8 Burton-Stone Lane, York.
 1884 ... Bennett, S. H., Westholme, Rotherham.
 1904 ... BENTINCK, Rt. Hon. Lord, M.P., Underley Hall, Kirkby Lonsdale.
 1919 ... BENTLEY, Miss ESTHER C., B.Sc., 3 Hardy Grove, Beeston Hill, Leeds.
 1907 ... BEVAN, D. W., 32 Nansen Street, Scarborough.
 1916 ... BILTON, EDWARD, 81 Abbey Street, Hull.
 1885 ... Bingley, Godfrey, Thornichurst, Shaw Lane, Headingley, Leeds.
 1919 ... BIRCH, WALTER G., 20 Barbican Road, York.
 1913 ... BIRMINGHAM NAT. HIST. AND PHIL. Soc., c/o W. H. Foxall, F.R.G.S., 81 Somerset Road, Handsworth Wood, Birmingham.
 1903 ... BISAT, G. B., 30 Nether Hall Road, Doncaster.
 1920 ... BISAT, WM. S., 1 Selwyn Avenue, North Ferriby, Hull.
 1920 ... BLADON, FRANK M., The Hornbeams, Sutton-on-Hull, E. Yorks.
 1921 ... BLACKSHAW, J. TREMAYNE, 38 Hill Gate, Doncaster.
 1909 ... BOOTH, G. A., M.B.O.U., The Hermitage, Kirkham, Lancs.
 1905 L.C. Booth, H. B., M.B.O.U., F.Z.S., Rynill, Ben Rhydding, Yorks.
 1894 ... BRADFORD PUBLIC FREE LIBRARY, c/o Butler Wood, Librarian, Bradford.
 1921 ... BRADLEY, A. E., 8 Shaftesbury Avenue, Roundhay, Leeds.
 1885 ... Branson, F. W., F.I.C., 13 Briggate, Leeds.
 1919 ... BRIGG, JOHN J., J.P., M.A., Kildwick Hall, Keighley.
 1892 ... BRITAIN, W.H., J.P., Storth Oaks, Ranmoor, Sheffield.
 1910 ... BROCKMAN, Dr. DRAKE, Cleveland Asylum, Middlesbrough.
 1919 ... BROOK, J. H., The Old Vicarage, Selby.
 1917 L. BROTHERTON, Colonel Sir E. A., J.P., The Hall, Roundhay, Leeds.
 1907 ... BROWN, J. A., Thornhill Street, Calverley, Leeds.
 1920 ... BROWN, JAMES MEIKLE, B.Sc., F.L.S., F.C.S., 176 Carter Knowle Road, Sheffield.
 1920 ... BROWNING, Miss D. M., B.Sc., 39 Grasmere Mount, Armley, Leeds.
 1920 ... BULMAN, Miss F. M., 15 Emerald Street, Saltburn-by-Sea.
 1910 C. BURNLEY, A. I., 43 Moorland Road, Scarborough.
 1914 C. BURRELL, WM. HOLMES, F.L.S., 44 West View, Horsforth, Leeds.
 1891 C. Burton, J. J., J.P., F.G.S., Rosecroft, Nunthorpe, R.S.O., Yorkshire.
 1921 ... BUTCHER, R. W., Botanical Department, The University, Leeds.
 — ... Butterell, J. D., The Manor House, Wansford, Hull.
 — * ... BUTTERFIELD, J. E., B.Sc., Ormesby, 21 Dorville Road, Lee, London, S.E.
 1918 ... BUTTERFIELD, Rev. FRANK, B. L., Jn., Oakfield, Pannal Ash, Harrogate.

- 1909 E. BUTTERFIELD, ROSSE, F.E.S., The Museum, Keighley.
 1916 L. BYWATER, MATTHIAS, 64 Park Road, Low Moor, Bradford.
- 1919 ... CARLETON, THOMAS, 15 Mill Street, Junction, Crosshills, Keighley.
 1913 ... CARLISLE, LADY, Boothby Manor House, Brampton, Cumberland.
 1891 L. CARPENTER, Hon. Mrs. B., 22 Grosvenor Road, Westminster, London.
 1903 ... Carr, Prof. J. W., M.A., F.L.S., University College, Nottingham.
 1919 ... CARR, WM., Stramington School, Kendal.
 1904 ... CASTLE, THOMAS, Orchard Villa, Heckmondwike.
 1905 ... CATTERALL, W. H., Rokeby School, Barnard Castle.
 1891 L. CHAMPNEY, J. E., J.P., 27 Hans Place, London, S.W.
 1910 ... CHAPMAN, E. H., M.A., 1 Kings Bench Walk, London, E.C.4.
 1910 ... CHEAVIN, H. S., F.R.M.S., F.N.P.S., F.E.S., Chemistry Dept., The Middlesex Hospital, Medical School, Berners Street, London W. 1.
 — P.L. Cheesman, W. N., J.P., F.L.S., The Crescent, Selby.
 1905 E.L.C. Cheetham, C. A., "Wheatfield," Old Farnley, Leeds.
- 1920 ... CHISLETT, RALPH, "Larkspur," Broom Crescent, Rotherham.
 1898 ... Chorley, Mrs. Mary, F.E.S., Woodhead, Burley-in-Wharfedale.
 — * L. Clark, J. E., B.A., B.Sc., Asgarth, Riddlesdown Road, Purley, Surrey.
 1892 ... Clarke, Alfred, 16 St. Andrew's Road, Huddersfield.
 — * P. CLARKE, W. EAGLE, F.L.S., 35 Braid Road, Edinburgh.
 1892 L.C. Clarke, W. J., F.Z.S., LL.D., 33 Oak Road, Scarborough.
 1917 ... CLEGG, COLIN, A.M.Inst.C.E., F.G.S., More Hall, Bolsterstone, near Sheffield.
 1906 ... Clough, Sam, Steeton Hall, near Keighley.
 1915 ... COCKERLINE, THOS., 14 Leicester Place, Blackman Lane, Leeds.
 1919 ... COCKSHAW, EDWARD, 65 Blacker Road, Birkby, Huddersfield.
 1919 ... COLE, E. W. MAULE, Hillside, Northiam, Sussex.
 1891* L. COOKE, J. S., J.P., F.R.A.S., Ploverfield, Ben Rhydding, Yorks.
 1911 ... COOPER, Miss C. A., California Road, Bushey Heath, Herts.
 1890 C. Corbett, H. H., M.K.C.S., F.L.S., 3 Thorne Road, Doncaster.
 — * ... CORDEAUX, Mrs., Great Coates, R.S.O., Lincoln.
 1915 ... COLDWELL, SIDNEY H., 18 Clifton Terrace, Beverley Road, Hull.
 1908 ... COWLING, H., 10 Bradley Road, Silsden, near Keighley.
 1903 E. CROFT, E. O., M.D., 12 North Hill Road, Headingley.
 1916 ... CROFT, FRANK, Bank House, Leyburn, S.O.
 1915 ... CROW, EDWARD R., 12 Filey Road, Scarborough.
 1896 ... Crowth, J. E., Portland Street, Elland.
 1894 ... Crump, W. B., M.A., The Lodge, Rastrick Common, Brighouse.
 1910 ... CRYER, JOHN, 182 Cliffe Wood Mount, Bradford Road, Shipley.
- 1914 ... DALE, HAROLD A., School House, Askrigg.
 1921 ... DALLMAN, A. A., 17 Mount Road, Higher Tranmere, Birkenhead.
 1898* ... DARLEY, Rev. BERTRAM, Harthill Rectory, Sheffield.
 1896* P.H.L. Dawkins, Sir W.B., M.A., F.R.S., Owens College, Manchester.
 (Ex-President).
- 1883 ... DAWSON, PERCIVAL W., 107 Westbourne Avenue, Hull.
 1908 ... DENNIS, THOMAS, 21 Peel Street, Hull.
 1885 ... Denny, Prof. Alfred, F.L.S., 61 Rammoor Crescent, Sheffield.
 1903 L. DENT, Major J. W., Ribston Hall, Wetherby.
 1915 ... DOUGLAS, D. FRASER, Stourton Ford, Ilkley.
 1921 ... DRAKE, WALTER, 10 Lyell Street, Scarborough.
 1913 ... DUDLEY, HAROLD E., 137 Frodingham Road, Scunthorpe, Lincs.
 1906 ... Dwerryhouse, A. R., D.Sc., F.G.S., Geological Dept., Ireland University, Belfast.
- 1898 ... EDEN, Hon. Miss AGNES, Ford House, Wangford, Suffolk.
 1910 C. Edmondson, F. H., The Lindens, Utley, Keighley.
 1901 ... EDMONDSON, Prof. T. W., M.A., New York University, University Heights, New York, U.S.A.
- 1904 ... EDWARDS, Rev. J. R. W., M.A., The Grammar School, Leeds.
 1920 ... ELGEE, F., F.G.S., 'Shirley,' Rookwood Road, Nunthorpe, R.S.O.
 1912 ... ELLIOTT, THOS., Beechville, Cambusbarron, Stirling.
 1893 ... ELMHIRST, C.E., 29 Mount Vale, York.
 1921 ... ELWESS, W., 66 Thorne Road, Doncaster.
 1921 ... EWING, JAMES, D.Sc., Botanical Department, The University, Leeds.
- 1909 E.C. Falconer, W., F.E.S., Wilberlee, Slaithwaite, Huddersfield.
 1918 ... FARRAR, FRANK, 17 Leasowe Terrace, Hunslet Carr, Leeds.
 1920 ... FERROLE, EDWARD L., Bank House, Penistone.
 1908 ... FIELDING, W., 24 Ventnor Terrace, Halifax.
 1892* ... Fierke, F. W., 86 Grafton Street, Hull.
 1920 ... FIRTH, HARRY, 45 Leeds Old Road, Bradord.
 1912 ... Firth, J. Digby, F.L.S., F.E.S., March Institute, Woodhouse Moor, Leeds.
 1919 ... FLETCHER, CHAS. HARTLEY, Apsley House, Albion Road, Scarborough.
 1920 ... FLINTOFF, ROBT. J., "Gale," Cardigan Road, Bridlington.
 1897 ... FOGGITT, T. J., Stoneybrough, Thirsk.
 1911 ... FORDHAM, A. A., Department of Applied Science, The University, Sheffield.
 1905 ... Fordham, W. J., City Hospital, Winter Street, Sheffield.
 1909 ... FORREST, H. E., "Hill Side," Bayston Hill, Shrewsbury.
 1887 P. Fortune, Riley, F.Z.S., 22 Ripon Road, Harrogate.

- 1908 ... FOWLER, T. M., "Elsinore," Dodsworth Road, Barnsley.
 1909 ... FRYER, Dr. J. H., East Gate, Barnsley.
 1913 E. *Fysher, Greevz*, 78 Chapel Allerton Terrace, Leeds.
 1915 ... FYSHER, Mrs. G., 78 Chapel Allerton Terrace, Leeds.
- 1885 ... *Gardner, John*, F.L.S., Laurel Lodge, Hartlepool, West Hartlepool.
 1916 ... GARFORTH, Sir WM., LL.D., Snydale Hall, near Pontefract.
 1908 E.C.P. *Garstang, Prof.*, W., D.Sc., M.A., F.Z.S., University, Leeds.
 1883 ... *Gaunt, Leonard*, Hazelbrae, Farsley, Leeds.
 1886* ... GAUNT, Mrs. LEONARD, Hazelbrae, Farsley, Leeds.
 1917 P.H.L. GEIKIE, Sir ARCHIBALD, O.M., K.C.B., LL.D., Shepherd's Down, Haslemere, Surrey.
 1915 L. GIBSON, EDWARD B., L.D.S., Croft Terrace, Hebden Bridge.
 1904 ... GIBSON, J., F.R.M.S., Elmfield, 192 Salter Lane, Sheffield.
 1918 ... GIBSON, SAM., Primrose Cottage, Hebden Bridge.
 1913 E.C. *Gilligan, Albert*, D.Sc., B.Sc., F.G.S., Geological Department, The University, Leeds.
- 1914 ... GOUGH, J. H., Ph. C., 4 Woodland Grove, Newton Road, Leeds.
 1920 ... GRACE, GEORGE, B.Sc., F.G.S., 23 Alexandra Crescent, Ilkley.
 1920 ... GRAINGER, Miss J., Wood Nook, Slaithwaite.
 1915 ... *Granger, James V.*, Willow Grove, Manston.
 1908 ... *Greaves, A. E.*, 52 Cecil Street, Goole.
 1914 ... *Greaves, Walter*, 1 Chapel Avenue, Hebden Bridge.
 1918 ... GREENWOOD, Miss F. VERA, B.Sc., Stoodley Hall, Todmorden.
 1918 ... GREENWOOD, THOS. FENTON, 9 Eiffel Street, Hebden Bridge.
 1919 ... GREENING, LINNAEUS, F.L.S., F.Z.S., M.B.O.U., "Fairlight," Grappenhall, Cheshire.
 1921 ... GREENWOOD, SAM, Nutclough House, Hebden Bridge.
 1907 ... GRIMSHAW, P. H., Royal Scottish Museum, Edinburgh.
 1921 ... GRIST, W. R., B.Sc., Secretary Appointments Board, The University, Leeds.
 1921 ... GRIST, Mrs. W. R., 2 Balmoral Terrace, Headingley, Leeds.
- 1887 ... HAIGH, G. H. CATON, M.B.O.U., Grainsly Hall, Great Grimsby.
 1902 ... HALEY, W. B., 9 Myrtle Road, Ravensthorpe, Dewsbury.
 1889 L. *Hall, A. E.*, F.E.S., Cranfield House, Southwell, Notts.
 1890 ... HALLIMOND, H. T., "Escomb," Sleights, S.O. near Whitby.
 1919 ... HALLOWELL, ERNEST, 12 Edward Street, Sowerby Bridge.
 1910 ... HARDY, C. J., Langdale, Dore, near Sheffield.
 1909 C. *Hargreaves, J. A.*, 40 North Marine Road, Scarborough.
 — P. *Harker, Alfred*, M.A., F.R.S., St. John's College, Cambridge.
 1918 ... HARPER, JOSEPH, 14 Otto Terrace, Sunderland.
 1908 ... HARROGATE PUBLIC LIBRARY, c/o G. W. Byers, Victoria Avenue, Harrogate.
 1897 ... *Hartshorn, J.*, Leyburn, R.S.O., Yorkshire.
 1917 ... HARVEY, Rev. REGINALD H., The Rectory, Barwick-in-Elmet, Leeds.
 1891 ... *Hawkesworth, Edwin*, Sunnyside, Crossgates, Leeds.
 1907 ... HAWLEY, Sir H. C. W., Holly Mount, Hurst Woods, Buxsted, Sussex.
 1908 E. *Hayby, Fred*, 11 Necropolis Road, Lidget Green, Bradford.
 1920 ... HAYDOCK, ARTHUR, High Street, Settle.
 1919 ... HEATON, HARRY, Cot Field, Roundhay, Leeds.
 1913 ... HEBDEN, THOS., Hainworth Lane, Keighley.
 1920 ... HENDERSON, JOHN, Kettlewell, *via* Shipton.
 1897 ... *Herdman, W.*, F.G.S., St. John's Chapel, Co. Durham.
 1919 ... HILARY, Miss DAISY, B.Sc., 15 Plevna Terrace, Bingley.
 1920 ... HIND, Miss MILDRED, B.Sc., 31 Royal Avenue, Doncaster.
 1910 ... HOBSON, BERNARD, B.Sc., F.G.S., Thornton, Hallam Gate Road, Sheffield.
 1920 ... HOLDER, F. W., 20 Hawesside Street, Southport.
 1895 ... HOLLINGWORTH, J., M.R.C.S., 2 Hornsea Parade, Holderness Road, Hull.
 1908 L.C. *Holmes, John*, 9 Campbell Street, Crosshills, near Keighley.
 1884 ... *Horne, William*, F.G.S., Market Place, Leyburn, R.S.O., Yorks.
 1921 ... HORRELL, E. CHAS., 23 Victoria Terrace, Belle Vue Road, Leeds.
 1909 E. *Howard, G.*, Sitwell Vale, Moorgate, Rotherham.
 1919 ... HOWARD, J. R., 5 Rowden Villas, Shotton, Chester.
 — ... HOYLE, W. E., Dr., M.A., National Museum of Wales, City Hall, Cardiff.
 1904 ... *Hutton, W. Harrison*, 44-46 Dial Street, Leeds.
- 1520 ... ILLINGWORTH, JOHN L., "Gowan Lea," Queen's Drive, Ilkley.
 1896 C. *Ingham, William*, B.A., 6 Sycamore Terrace, Clifton, York.
 1917 ... INGLE, EDWARD J. T., 18 Strattan Street, off Willow Terrace Road, Leeds.
 1904 C. *Irving, J.*, M.D., Inagh Mount, 15 Filey Road, Scarborough.
- 1907 ... *Jackson, E. W.*, F.C.S., Godrevy, Saltburn-by-Sea, Yorks.
 1914 ... JACKSON, WARD, 11 South View Terrace, Silsden, Keighley.
 1907 ... JOHN CRERAR LIBRARY, c/o H. Grevel & Co., 33 King Street, Covent Garden, W.C.
 1904 ... *Johnson, J. W. H.*, M.Sc., F.G.S., Grange View, Walton.
 1907 E.C. *Johnstone, Miss, M.A.*, LL.A., M.Sc., F.L.S., 9 Victoria Avenue, Cheadle Hulme Cheshire.
 1903 L. *Jones, R. Fowler*, 8 Lendal, York.
 1919 ... JONES, RICHARD, 24 Rutland Park, Sheffield.
 1903 ... JORDAN, A., Claremont, Windsor Road, Doncaster.
 1905 ... *Jowett, F.*, Hammondale, Eldwick, Bingley.

52 Y.N.U.: List of Members and Affiliated Societies.

- 1892 P.E.C. *Kendall, Percy F.*, M.Sc., F.G.S., Sandhills Lane, Moor Allerton, Leeds.
 1888 C. *Kidston, Robert*, LL.D., F.R.S., 12 Clarendon Place, Stirling.
 — L. *Knubley, Rev. E. P.*, M.A., Steeple Ashton Rectory, Trowbridge, Wilts.
- 1906*P.H.L. *LAMPLUGH, G. W.*, F.R.S., F.G.S., 13 Beaconsfield Road, St. Albans.
 1908 ... *LAVERACK, CLIVE*, Ph.D., Broughton Rise, Malton.
 1919 ... *LAWSON, F. H.*, Thurstonville, Brighouse.
 1902 ... *Lawton, Fred*, Carlton Terrace, Lane End, Skelmanthorpe, Huddersfield.
 1907 ... *LEEDS PUBLIC LIBRARY*, c/o T. W. Hand, Public Library, Leeds.
 1889 ... *Lofthouse, J. H.*, Lyell House, 62 Dragon Parade, Harrogate.
 1899 C. *Lofthouse, T. A.*, F.E.S., 129 Albert Road, Middlesbrough.
 1919 ... *Longbottom, Maurice*, 33 South View Terrace, Silsden, Keighley.
 1910 ... *LOTHERINGTON, E. B.*, 39 Grange Avenue, Scarborough.
 1898 ... *LUCAS, B. R.*, Winnington Lodge, Winnington, Northwich, Cheshire.
 1919 ... *LUMB, J. H.*, 32 Undercliffe Terrace, Scar Bottom, Halifax.
 1907 E. *Lumby, A. Haigh*, Nab Drive, Shipley.
 1884 ... *Lund, Percy*, 57 Southfield Square, Bradford.
- 1908 ... *MALONE, MICHAEL*, 3 Ingleby Street, Brownroyd, Bradford.
 1920 P.H.L. *MARR, Prof. J. E.*, Sc.D., F.R.S., Sedgwick Museum, Cambridge.
 1919 ... *MARSDEN, W.*, A.M.I.M.E., 7 Heathfield Place, Halifax.
 1914 ... *MASON, C. W.*, 78 Beverley Road, Hull.
 1905 ... *Mason, F. A.*, 29 Frankland Terrace, Leopold Street, Leeds.
 1901 ... *MASSEY, HERBERT*, F.E.S., Ivy Lea, Disbury, Manchester.
 1920 ... *MATTHEWMAN, S.*, 52 Belle Vue Road, Leeds.
 1912 ... *MEGSON, ALBERT*, Fern Villa, Headlands, Ossett.
 1914 ... *MELLISH, MARGERY*, Stonebridge Lower House, Wortley, Leeds.
 1896 ... *MELROSE, J.*, Clifton Croft, York.
 1894 ... *MELVILL, J. C.*, M.A., F.L.S., Meole, Brace Hall, Shrewsbury.
 1907 ... *MIDGLEY, H.*, Glendene, Anlaby, near Hull.
 1908 ... *MIDGLEY, T.*, Chadwick Museum, Bolton.
 1893 L. *MILLS, F. W.*, F.L.S., F.R.M.S., Thornleigh, Huddersfield.
 1918 ... *MILSON, F. E.*, B.Sc., High Cross, Kirkburton, Huddersfield.
 — ... *Moiser, H. R.*, F.G.S., Heworth Grange, York.
 1919 ... *MOORE, ALBERT J.*, Ousefield Poultry Farm, Kiccall, Yorks.
 1896 ... *Moore, Harry*, F.R.M.S., 12 Whiston Grove, Rotherham.
 1900 ... *MOORE, H. H.*, 5 Olga Avenue, Cowersley, Milnsbridge, Huddersfield.
 1906 C. *Morley, B.*, Wind Mill, Skelmanthorpe, Huddersfield.
 1914 ... *MORRIS, M. C.*, 6 Telford Terrace, York.
 1883 ... *MORRISON, WALTER, J.P.*, Malham Tarn House, Settle.
 1905 ... *MORSE, E. W.*, c/o G. Oldfield, Lynn, Crescent Road, New Barnet, Herts.
 1906 ... *MOSES, G. W.*, West View, Bishop Auckland.
 1919 ... *MOSLEY, PERCY*, 5 Skipton Road, Stetton, Keighley.
 1919 ... *MOSS, CHAS. H.*, Woodside, Rotherham.
 1920 ... *Murphy, H. N.*, B.Sc., 3 Cromer Terrace, Leeds.
 1920 ... *MUSGRAVE, E.*, B.Sc., 18 Lister Lane, Bradford.
 1909 C. *Musham, J. F.*, F.E.S., 48 Brook Street, Selby.
- 1886 ... *Naughton, John*, Ellesmere School, Park View, Harrogate.
 1889 ... *Naylor, E.*, Corner Garth, Leadhall Lane, Leeds Road, Harrogate.
 1901 ... *NEWCOMEN, G. H. T.*, Kirkleatham Hall, Redcar.
 1890 L. *NEWTON, Rev. Canon H.*, Vicarage, Redditch.
 1915 ... *NEWTON, C. B.*, F.G.S., Waterworks Engineer, Hull.
 1919 ... *NORTON, THOS.*, O.B.E., D.L., J.P., Bagden Hall, Denby Dale, near Huddersfield.
- 1890 L. *OXLEY, H.*, Spenfield, Weetwood, Leeds.
 1888 ... *OXLEY, Rev. W. H.*, M.A., The Cottage, Filey.
- 1920 ... *PARKER, THEODORE*, A.R.S.I., F.R.H.S., 4 Brookfield Place, Leeds.
 1906 E. *Parkin, W. H.*, Studholme, Shipley.
 1920 ... *PARKINSON, HERBERT*, 52 Noton Lees Road, Meersbrook, Sheffield.
 1891 P.L. *Pawson, A. H.*, J.P., F.L.S., Howe Combe, Watlington, Oxon.
 1891 L. *PAWSON, Mrs. A. H.*, Howe Combe, Watlington, Oxon.
 1919 ... *PEACOCK, Rev. E. ADRIAN WOODRUFFE*, Grayingham, Lines.
 1893 ... *Peake, Rev. Edward*, M.A., Cathedral Choir House, Oxford.
 1918 ... *PEARSON, A. A.*, F.L.S., 59 Southwark Street, London, S.E.1.
 1920 C. *PEARSALL, W. H.*, M.Sc., 1 Woodsley Terrace, Clarendon Road, Leeds.
 1909 E.C. *Peck, A. E.*, 20 Avenue Road, Scarborough.
 1893 ... *Petch, T.*, B.Sc., B.A., The Lawn, Peradeniya, Ceylon.
 1920 ... *PHILLIPS, Major G. W.*, 21 Lawn Road, Doncaster.
 1911 ... *PICKLES, A.*, 56 Tufton Street, Silsden, Keighley.
 1921 ... *PICKLES, J. W.*, Thornton, near Bradford.
 1920 ... *PICKERING, G. F.*, Woodcroft, Horsforth, near Leeds.
 1918 ... *POLLARD, H.*, M.R.C.V.S., 1 Warren Terrace, Wakefield.
 — P.E.L. *Porritt, G. T.*, F.L.S., F.E.S., Elm Lea, Dalton, Huddersfield.
 1896 L. *PRIESTLEY, P. N.*, Kingswood, Sholebroke Avenue, Chapelton, Leeds.
 1911 ... *PRIESTMAN, G. E.*, Hollin Grange, Wharfedale, Ilkley.
 1911 L.E. *PRIESTLEY, Prof. J. H.*, B.Sc., The University, Leeds.
 1920 C. *PROCTER, C. F.*, 522 Holderness Road, Hull.

- 1919 ... *Pullan, Fred*, 9 Oban Place, Armley, Leeds.
 1898 ... PUNCH, J. W. R., Hastoe House, Southfield Road, Middlesbrough.
 1894 ... PUNSHON, Mrs. K. M., Ingleby House, Northallerton.
- 1917 L. RATCLIFFE, Mrs. CHARLES, Eagle Hall, Pateley Bridge.
 1919 ... REED, FREDERICK, Parkside, Hartburn Lane, Stockton-on-Tees.
 1917 C. RHODES, FRED, 113 Park Row, Heaton Road, Bradford.
 1919 ... RIDDELL, ROBERT G., M.D., F.R.C.S.E., Chilton Lodge, Rotherham.
 1920 ... RIDGEWAY, Miss, 4 Springfield Mount, Leeds.
 1919 ... RILEY, Miss ANNIE, Elizabeth Street, Elland.
 1912 ... ROE, T. B., 29 West Street, Scarborough.
 1908 ... ROBERTS, S., jr., M.A., The Beeches, Park Grange, Sheffield.
 1920 ... ROBERTS, T. N., 38 West Bank, Scarborough.
 1890* ... *Roberts, Walter*, F.R.G.S., Lynwood, Avenue Road, Doncaster.
 1898 ... *Robertshaw, A. Gibson*, Gordon Bank House, Midgley, Luddenden Foot, R.S.O.
 1892 C. *Robinson, J. F.*, 22 Harley Street, Hull.
 1915 ... ROBINSON, Miss H. M. S., B.A., F.L.S., Rosenhurst, Bewdley.
 1908* ... ROBINSON, WILFRED, D.Sc., 23 North Avenue, Garden Village, Levenshulme, Manchester.
 1907 ... ROOSE, T., Bolton Abbey, Skipton.
 1915 ... ROOME, GEORGE W., B.Sc., F.G.S., 214 Psalter Lane, Sheffield.
 1921 ... ROSS, PERCIVAL, F.G.S., A.M.Inst.C.E., 41 Manville Terr., Morley St., Bradford.
 — L. *Rownlree, J. H.*, Scalby Mabs, Scarborough.
 1920 ... RUDD, R. H., "Brantwood," Grt. Horton, Bradford.
 1916 ... *Rushworth, Miss E. E.*, 22 Carlton House Terrace, Halifax.
- 1890 P.C. *St. Quintin, W. H.*, J.P., D.L., M.B.O.U., Scampston Hall, Rillington, York.
 1908 ... *Sanderson, A. R.*, Research Laboratory, Petaling, Federated Malay States.
 1897 ... SANER, C. O. F., Cottingham, near Hull.
 1907 ... *Saunders, T. W.*, 7 Yarborough Terrace, Bentley Road, Doncaster.
 1920 ... SCHROEDER, W. LAWRENCE, M.A., 40 Clifton Road, Halifax.
 1920 ... SEAMAN, FRED, "Kirkfield," Ben Rhydding.
 1921 ... SEATON, J. ARNOLD, Kingswood, Grimscar, Huddersfield.
 1911 P.C. SEWARD, Prof. A. C., M.A., F.R.S., Botany School, Cambridge.
 1900 ... *Sewel, J. T.*, J.P., Arren, Bagdale, Whitby.
 1914 ... SHARP, HERBERT J., Langford Villa, Filey.
 1886 ... SHEFFIELD CENTRAL FREE LIBRARY, Sheffield.
 1915 ... SHEPPARD, GEO., B.Sc., F.G.S., The Imperial Oil Co., Ltd., Geological Department, Imperial Oil Buildings, Toronto, Canada.
- 1897 P.H.L. *Sheppard, T.*, M.Sc., F.G.S., F.R.G.S., The Museum, Hull.
 1917 ... SIMPSON, J. R., Glenesk, Selkirk.
 1912 ... SLACK, R., Heather Cottage, Kildwick, *via* Keighley.
 1904 ... SLATER, H., North End, Northallerton.
 1917 ... SMART, H. DOUGLAS, Clifton House, Shelley.
 1920 ... SMITH, A. MALINS, Biological Department, Technical College, Bradford.
 1907 E.C. *Smith, S. H.*, 78 Huntington Road, York.
 1903 P. *Smith, W. G.*, B.Sc., Ph.D., College of Agriculture, George Square, Edinburgh.
 1897 ... *Snelgrove, E.*, B.A., Whiteley Wood, Sheffield.
 1919 ... SPENCER, T. J., F.R.G.S., 8 Heath Hall, Halifax.
 1904 E. *Stainforth, T.*, B.A., B.Sc., 90 Ryde Street, Hull.
 1918 ... STANSFIELD, HARRY, Ribstone Street, Bankfields, Mytholmroyd, S.O.
 1904 C. *Stather, Major A. J.*, 206 Westbourne Avenue, Hull.
 1891 E.C. *Stather, J. W.*, F.G.S., Brookside, Newland Park, Hull.
 1911 ... STEAD, J. E., F.R.S., 11 Queen's Terrace, Middlesbrough.
 1919 ... STEEDMAN, J., Catterick, Yorks.
 1911 ... STEPHENS, Rev. THOS., Horsley Vicarage, Otterburn, S.O., Northumberland.
 1919 ... STEPHENSON, H. L., 90 Tempest Road, Beeston Hill, Leeds.
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Total number of members belonging to the Yorkshire Naturalists' Union	399
Total number of Subscribing Societies	...	...	...	34

—: O :—

Another N.E. Yorkshire record of *Mutilla europaea* L.—To Mr. Fordham's records of this interesting insect (*antea* p. 364) can be added a solitary specimen—also a female—taken by Mr. W. Pearson, of Scarborough, on Ebberston South Moor on the 9th September, 1901. This is some miles distant from the localities given by Mr. Fordham.—GEO. B. WALSH, Scarborough.

***Hypnum exannulatum* (Gümb.) near N. Ferriby.**—This moss, which is usually associated with hilly country, but which occurs also at Skipwith and Pilmoor, has been found recently in a sub-fossil state in late Glacial deposits on the fringe of the Red Cliff moraine at Melton, North Ferriby. Quite a large quantity of the moss was seen, intercalated in a calcareous loam, in layers varying from single strands up to pads of half-an-inch and more in thickness. Although the loam has been proved over several acres, the moss has only been seen in an area about ten yards square. The bed in which it lies shews signs of glacial plucking and is overlaid by chalk gravels, which in their turn are (a hundred yards away) much squeezed, and covered by a rich reddish-brown clay, with angular flints and chalk chips. Boulder clays and laminated clays underlie the moss beds. In Europe the moss is known from the lowlands to 5,000 feet. I am much indebted to Messrs. Chris. A. Cheetham and Burrell for the identification of the moss and for the above particulars of its vertical range and previous records from the lowlands of the Vale of York.—W. S. BISAT, North Ferriby.

REVIEWS AND BOOK NOTICES.

Faith in Fetters, by the Rev. T. R. R. Stebbing (T. Fisher Unwin, 223 pp., 6/- net). Some little time ago the author of this work rather upset the equanimity of some of the good members of the South-Eastern Union of Scientific Societies by his presidential address, which some of them considered to be 'profane.' The author has now extended his remarks in the present volume, which is doubtless influenced by his studies in natural history, and appeals to the National Church to purify itself from a dense load of ignorance and prejudice, and to the men of light and leading in its ministry to renounce all hypocritical evasion and boldly avow themselves the champions of Sincerity and Truth.

Zoology, a textbook for Colleges and Universities, by T. D. A. Cockerell (Harrap, Ltd., 558 pp., 10/6 net). Of perhaps a more technical character than the preceding volumes, is this by the Professor of Zoology in Colorado. The author is a great believer in illustrations and various forms of animals are represented by over two hundred photographs and diagrams. The volume is much more readable than the usual text book, and among the chapters are interspersed articles on 'Mendelism,' 'Variation,' etc. As a sample of the author's style we may quote one paragraph: 'Many years ago the baby lions in the London Zoological Gardens died in numbers, in spite of the fact that the animals were well housed and given expensive food. In Dublin, where conditions were not supposed to be so good, the young lions lived. It turned out that the death of the London lions was owing to a rickety condition of the base of the skull, and this in turn to a deficiency of lime in the milk of the lionesses. This deficiency appeared to be owing to the fact that the beasts had been fed on good cuts of meat, with too little bone. In Dublin, where they could not afford to treat them so well (as they considered it), they gave them more bone and less meat, with the good results already mentioned. Thus, while the cells can do marvellous tricks of conjuring, there are limits to its power.'

—: o :—

The price of *Discovery* has been increased from 6d. to 1/- monthly.

The *Yorkshire Post* of November 30th records a Little Auk shot at Wreton, near Pickering.

The Museum and Art Gallery presented to West Hartlepool by Sir William C. Gray, Bart., was opened on November 4th by Capt. Gray. Lieut.-Col. L. Robson, C.M.G., D.S.O., presided over a large gathering.

The Annual Meeting of the Lincolnshire Naturalists' Union was held on November 11th at Lincoln. Mr. Medlicott stated that in North Lincs. the barn owl had adopted the curious habit of hunting by day. He had seen many hunting between 10 a.m. and 3 p.m. He thought the reason was lack of food, as they seemed to be in a very starved condition. He also reported an instance of a cuckoo, with an unmistakable note, appearing in two seasons in succession in the same locality. Regarding mammals, two white stoats were shot during the winter north of Scunthorpe. On August 23rd he watched for five minutes a stoat rolling a hen's egg from a nest over rough ground for thirty yards. The stoat did it all quite easily with the point of its nose, and travelled at about walking pace. In the autumn of 1919, voles—probably the short-tailed field vole—did great damage to young sycamore trees in a small mixed plantation by eating the bark. Hundreds of trees were damaged up to 20 ft. high, but only sycamore trees were touched. Badgers, not common in the district north of Scunthorpe, returned to an old earth in 1919, which had not been occupied for eight years, and bred there successfully in 1919 and 1920. The Rev. F. S. Alston was elected President for the ensuing year. In his presidential address, Mr. J. F. Musham spoke on 'Some Molluscan ways as observed in the Field and Captivity.'

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JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

COMMITTEE OF SUGGESTIONS.

A further meeting of all interested in the Peat question will be held in the Geological Department, Leeds University (entrance De Grey Road), on Friday, February 11th, at 7-30 p.m.

Mr. W. H. PEARSALL will re-open a discussion on the 'Significance of Buried Trees in Peat.'

Convenor : CHRIS. A. CHEETHAM.

VERTEBRATE SECTION.

President of the Section : S. H. SMITH, York.

TWO MEETINGS will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 respectively, on Saturday, February 19th, 1921.

Business :

To appoint Bird Watchers for 1921, and to discuss other matters in connexion with the Yorkshire Wild Birds' and Eggs' Protection Acts' Committee.

Papers will be given as follows :—

'Fish Scales and their transformation,' Prof. Garstang, M.A., D.Sc., F.Z.S.

'Notes on the Past and Present Status of the Buzzard Peregrine and Raven in Yorkshire,' Riley Fortune, F.Z.S.

'Notes on the Twite,' W. Parkin.

'Notes on the Cormorant,' R. Chislett.

'Notes on Bird Life,' T. M. Fowler.

There will be lantern illustration.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend and to bring notes, specimens, lantern slides, etc.

Will officials of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR, *Hon. Sec.*,
Stancliffe, Mount Villas, York.

SECRETARIATE.

Messrs. W. H. PEARSALL, M.Sc., F.L.S., and F. A. MASON, F.R.M.S., of Leeds, have agreed to act as Hon. Secretaries of the Yorkshire Naturalists' Union; communications should be addressed to the Hon. Secs., Y.N.U., at The University, Leeds.

WILL anyone give me, or sell me, a copy of *THE NATURALIST* for MARCH, 1919? I have lost mine, and the number is out of print.

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Discovery. (Liverpool, 4to). 1891.

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THE EDINBURGH REVIEW.

We are glad to see that *The Edinburgh Review* discusses almost every possible subject likely to interest literary and scientific readers. In No. 474 of that journal Mr. Harold Russell has an interesting essay on 'Parasitic Insects: The Strepsiptera.' In this he points out that 'the Student of parasitism will find the Strepsiptera—the Twisted-winged insects—one of the most interesting groups. He will do so partly on account of their remarkable life history and the divergence between the two sexes, and partly on account of the strange effects which the parasites have on their hosts. These latter are for the most part wasps, bees and homopterous leaf-hoppers. In 1813 the Rev. William Kirby, one of the fathers of British entomology, suggested that these minute insects, which are in so many ways anomalous, should form an order of their own. This view is now accepted by the best authorities as well founded; but in many text-books, even down to recent days, they are treated as *Stylopidae*, a single family included among beetles or at least akin to them. The order which Kirby established has been variously placed, sometimes next beetles, then next two-winged flies, and even among dragon flies and neuroptera. There are still doubts as to their true affinities.'

PERFECT FEMALES.

'The course of metamorphosis which the young Strepsiptera have developed is more complicated than in any other order. The parasitic habits which they have contracted are in several respects unique. The nervous system is highly developed. The sexes when adult are utterly unlike one another not only in appearance, but also in habits. The adult male is an active little winged insect, never more than a quarter of an inch long; it spends a short life [but apparently a gay one!], flying in the sunshine with a great display of energy. The adult female is a degraded grub-like creature which remains for life inside the body of the bee, wasp, or other insect which acts as host. As a female she performs her duties to perfection; and the student of parasitism, but for the fear of being thought cynical, might point to her in order to refute those who argue in favour of feminist activities.'

KINGMOOR NATURE RESERVE.

'We hear with some alarm of the extraordinary suggestion made by your Unemployment Committee that the Kingmoor Nature Reserve should be "cleared and drained," and ruined for ever. The previous action of your Council in endeavouring to preserve this charming beauty-spot for all time has received the thanks of Nature lovers throughout the country, and has been emulated in other areas. The suggestion that this

fine achievement should be negatived, and that Kingmoor as a Nature Reserve should be irreparably ruined, seems beyond belief as an action of any enlightened City Council during the 20th century. Once "cleared and drained" the damage done can never be repaired, and future citizens of Carlisle will only be able to deplore the short-sightedness of those who were the City Fathers in 1920. Scientific men and Naturalists throughout the country know from the most valuable records which have appeared in this Journal, and in other scientific publications, of the treasures of Kingmoor, and how this valuable territory, under natural conditions, is available to the people of Carlisle. We all envy Carlisle students in the facilities they have for studying Nature as she is, and with them we sincerely trust that better counsels may be heard and the threatening catastrophe may be averted. Everyone will sympathise with the Unemployment Committee in endeavouring to find work for the unemployed, but surely there is ample work to be done on the roads, towards which Government grants may be obtained, or in other ways, without taking such drastic measures as those suggested.

STILL RESERVED.

We sent the preceding letter to the Carlisle press at the urgent request of our friends in Carlisle. It was followed up by letters from Messrs. D. L. Thorpe, L. E. Hope, F. H. Day, G. F. Saul and others. Fortunately this and other opposition proved effective, and Kingmoor is safe for the present. We sincerely trust, however, that such steps will be taken that will prevent the necessity for an agitation of this sort arising in the future.

REMOVING A REEF-KNOLL.

On another page Prof. Marr refers to the discussion on the origin of reef-knolls, which waxed warm at the meeting of the British Association at Bradford, in 1900, at which the writer was present. The late R. H. Tiddeman contended that the knolls were accumulations on the Carboniferous sea floor, formed after the manner of coral reefs. Prof. Marr opined that they were purely tectonic in origin and were formed during the faulting of the limestone. In support of his statement he pointed out that a reef-knoll in miniature existed at the apex of a fold in the limestone in the well-known Draughton quarry near Skipton.

AN EXCURSION.

To decide the matter, a week-end excursion was held in the field, and Mr. W. Whitaker, F.R.S., and Mr. G. W. Lamplugh, F.R.S., were appointed 'Lord High Executioners.' On the first day the knolls were visited under the guidance of Mr. Tiddeman, Prof. Marr being unable to attend. After

hearing our leader's views on the spot, we were satisfied that Tiddeman's theory was the correct one. On the second day, unfortunately, Tiddeman was indisposed, but Prof. Marr led the party, and on that date we were equally convinced that Prof. Marr's views were correct ! During the discussion which subsequently took place in Section C, it was stated that a careful examination had been made of the Draughton quarry, but no trace could be found of the miniature reef-knoll. 'No,' replied Prof. Marr, 'because I brought it away in my bag !' So that probably a Yorkshire reef-knoll reposes somewhere in a Museum at Cambridge.

FENLAND SILT.

In *The Geological Magazine* for December Mr. F. Hardy has a paper on 'The Mineral Composition of the Modern Fenland Silt, with special reference to the Carbonate Minerals.' A detailed microscopic examination shows that the generally accepted ideas as to the origin of the fenland silt are correct. Mr. Hardy concludes 'A sample of modern Fenland silt containing 8.98 per cent. of carbonate was found on mineralogical examination to include dolomite as well as aragonite in its mineral assemblage. The dolomite is present in fresh angular crystal grains, which suggest a secondary and recent origin of the mineral. It has possibly been deposited from sea-water which periodically covers the foreshore of the Fenland border of the Wash. The general mineral composition of the silt resembles closely that of certain geologically recent deposits of Cambridgeshire, and points to the boulder-clay left by the North Sea glacier as the chief source of the material of which the silt is composed. The silt has mainly been deposited by sea-currents which carry southwards the eroded glacial deposits of the South Yorkshire and North Lincolnshire coasts. An attempt is made to interpret the results of a chemical analysis of the silt in the light of its mineralogical composition, chiefly with regard to carbonate, potash, and phosphate. Muscovite is found to be the main source of potash, and apatite of phosphate in the silt.'

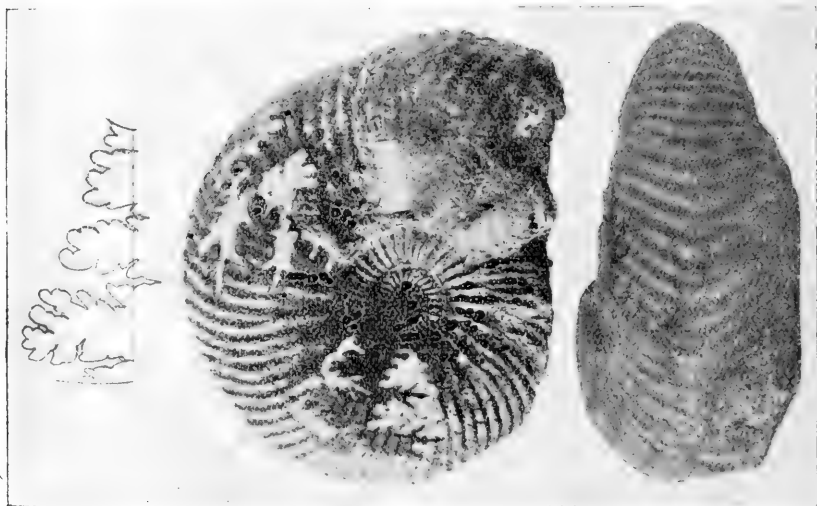
LIVERPOOL GEOLOGISTS.

The Liverpool Geological Society continues to publish its familiar pink-covered Proceedings, part 1 of Vol. XIII. having been recently received. The papers on China and the weight of Mountains are not of especial interest to the Liverpool Society, but the publication contains the Presidential Address of Dr. J. C. M. Given on 'The Divisions of the Pleistocene Period'; 'Marl and Marling in Cheshire,' and 'The Contribution of a local Geological Society to a Regional Survey,' both by Mr. W. Hewitt; and 'Coastal Changes at the mouth of the Alt.' There are too many misprints, and we think it

would be an advantage if those concerned were to read 'Notes on Bibliography, Publication and Nomenclature,' by C. Davies Sherborn, which appeared in *The Naturalist* for January, 1908.

TYPE AMMONITES.

We are glad to think that Mr. S. S. Buckman's enthusiasm has resulted in part 24 of his 'Type Ammonites' appearing; albeit the present prices of printing, etc., are almost prohibitive, as is nearly the price of part 24. We have struggled patiently with his nomenclature, but regret to say we have had to give it up, and in future before putting a name on to a fossil ammon-



ite we shall submit it to Mr. Buckman or other specialist, and probably find that the fossil is not an ammonite at all! The accompanying illustration of a Scarborough Kellaways Rock Fossil we presume would once, in the 'good old days,' be called *Ammonites ordinarium*. The label under it on plate CLXXXIII. of the present publication gives '*Quenstedticeras ordinarium*,' and '*Weissermeliceras longilobatum*, S. Buckman Callovian, *athleta*; Genotype, Holotype, p. 20.' On the next plate we have an illustration of *Ammonites ingens*, from Pickering. That is not so bad. But below is '*Dichotomoceras ingens*, Young & Bird, op. argovian, *Dichotomoceras*; see CXXXIX,' and there are a lot of 'futurist' zig-zags and curves on the plate which do not simplify matters. Next we get '*Ammonites poculum*,' type spec, 'from near Gristhorpe.' That we can manage, but as we read on it is '*Poculispinctes*

poculum, Bean-Leckenby sp. Livesian, *vertumnus*; Genotype, Holotype.'

PARATYPES AND PHAULOMORPHS.

This is followed by another *Ammonite poculum*, described as a 'paratype,' also from near Gristhorpe. But as we read on it is '*Poculispinctes auricularis*, nov. Divesian, *vertumnus*; Holotype. See CLXXXV.' We then have *Ammonites personatus* (Bean, M.S. Simpson, 1843, Holotype) from Robin Hood's Bay. That seems all right. But as we read on it is *Agassicerias personatum*, Bean-Simpson sp. Lymian, *agassicerias*. A phaulomorph. We should not have minded so much, perhaps, if it had not been 'a phaulomorph,' but that was the last straw. On the next plate we have *Ammonites erratus*, from Whitby. This is described as 'A cripple (dysmorph) without keel, cf. *Hild. bifrons*, CXIVB., and also as '*Pseudolioceras erratum*, Simpson sp., Whitbian, *exaratum*.' And so one might go on. But we refrain. We are writing this on Christmas Eve, and the 'waits' are singing 'While shepherds watch,' and 'Christians awake,' so we will make no further comment.

MR. G. W. LAMPLUGH, F.R.S.

At the recent annual meeting of the Yorkshire Geological Society, held at Leeds, Mr. G. W. Lamplugh, F.R.S., was unanimously elected President of the Society. This honour would certainly have been awarded to him some time ago, but Mr. Lamplugh felt that his duties at the Geological Survey would not enable him to give the time to the office that its importance warranted. His recent retirement, however, gets over this difficulty, and at the earliest moment thereafter his Yorkshire colleagues have given him the greatest honour in their power, and they look forward to the excursions and meetings of 1921. Mr. Lamplugh commenced his geological work among the Drifts, Chalk, and Speeton Clays around his former home at Bridlington, and for many years the Proceedings of the Yorkshire Geological Society were enriched by a series of papers recording his field observations, which later were summarised in three important memoirs dealing with the Drifts of Flamborough Headland, the Speeton Clay, and the Yorkshire Chalk respectively. On the Geological Survey Mr. Lamplugh gradually worked his way until he reached the post of Assistant-Director. He did excellent work there, his memoir on the Isle of Man being probably his most complete and successful achievement. With broad views, and with the knowledge gained by travelling in various parts of the world, Mr. Lamplugh will be welcomed back to his native county whole-heartedly. He is a past-president of the Geological Society of London, the premier Society of the

world. He was the President of the Yorkshire Naturalists Union some years ago, and *The Naturalist* has for many years benefitted by his papers and notes.

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Senecio aquaticus at Beverley: a Correction.—In my report of the flowering plants found during the Beverley Excursion in August last, I inadvertently recorded *Senecio palustris* (*The Naturalist*, p. 392). The plant collected was *Senecio aquaticus*.—D. M. BROWNING.

Abundance of Winter Moths in Yorkshire.—In contrast to the many accounts of scarcity of the common species of lepidoptera, it may be of interest to report that on Sunday, November 27th, 1920, an exceptionally mild evening, I saw twenty-nine males of *Cheimatobia brumata* on one well-lighted window at Shelley.—H. DOUGLAS SMART.

A precisely similar instance occurred here on the same evening. On the posts of two adjoining electric lights near his house at Brockholes, my son counted 25 and 19 moths respectively. Representative specimens he brought to me next morning, showed them to be chiefly *Hybernia defoliaria* and *Cheimatobia brumata*.—G.T.P.

Robin removing young from danger.—The note in *The Naturalist* for December, page 406, recalls to my mind an incident which, although it happened nearly fifty years ago has, so far as I know, never been recorded. My father had a garden on the outskirts of Shrewsbury, away from houses. In it was a summer-house of brick, in one corner of which was a cupboard containing tea things, etc. The top was flat, and on it, -against the back corner, a pair of Robins built a nest. We children took a great interest in it, and often used to go and look at it to see how it was getting on, but we were careful not to handle it or interfere in any way. The Robins went in and out through a small hole at the bottom of the door where the wood had rotted away. There was no other way to get into the summer house, so that it was impossible for a cat or other large animal to enter. At length the Robin hatched her eggs, and we saw the callow young alive in the nest. The very next day they had all disappeared. The nest was undisturbed, and no sign anywhere of disaster. We concluded at the time that the old Robins disliked our looking at them so often, and that they carried off the young to another nest in the next garden. This was never actually proved, but afterwards we saw both old and young Robins about the place, so evidently they had not come to grief.—H. E. FORREST, Shrewsbury.

THE RIGIDITY OF NORTH-WEST YORKSHIRE.*

J. E. MARR, SC.D., F.R.S.

IN thanking you for the honour you have done me by electing me as your President for the year, I must assume that it is not altogether undeserved, and I think a reason may be found in that I, like my two predecessors in the Woodwardian Chair, got much of my early training as a geologist in North-west Yorkshire, and as the present Reader in Petrology at Cambridge, the University Lecturer in Economic Geology, and the Assistant to the Professor, are Yorkshiremen, there is a happy connexion between the Cambridge school of Geology and your county.

Though not a Yorkshireman myself, I was born within sight of the county, and one of my earliest recollections as a child is of Ingleborough rising above the Lune Valley, as seen from the high ground above Lancaster; and since that day the tract of country to which that hill belongs has been to me a favourite district for study and recreation. I regard it to a large extent as my geological school-room, and was happy in my masters. The ancient slate-rocks of the dales about Ingleborough were studied under the guidance of McKenny Hughes, and before this I had examined the Carboniferous rocks, the glacial phenomena and the underground drainage during many a walk over the hills with Tiddeman, who first taught me practical geology. It would be impertinent to talk of the importance of Tiddeman's work to an audience of Yorkshire naturalists, who know and appreciate it so fully, but I cannot refrain from saying a word about the man, whom to know was to love. I was a schoolboy when I first knew him, and for nearly half a century benefited by his friendship. Some of you may know that he and I differed as to the interpretation of certain geological structures in the West Riding, of which he was the discoverer. It was perhaps presumptuous of the pupil to differ from his master, and although I believe I was right, the matter must be regarded as still unsettled. I mention it here to state that my action made no difference in our friendship, unless, indeed, his treatment of me was, if possible, more kindly than before, as though to show me that he bore no ill-will. And now, when I look back to those bright days spent in that favoured district, I am ever conscious of that happy friendship.

In considering the geological structure of North-west Yorkshire one must also deal with parts of Westmorland, Durham, North-east Cumberland and portions of Northumberland,

* Presidential address to the Yorkshire Naturalists' Union, delivered at Bradford, December 4th, 1920.

which are physiographically one with it. If one were asked what is the distinguishing feature of this area, one would probably name the prevalence of limestone ; but it seems to me that a much more important characteristic is the general horizontality of the beds which occur therein, and it is upon this that I wish to dwell at some length.

It is well known that certain blocks of the earth's crust have maintained a state of rigidity through geological ages. Many such blocks have a foundation of highly altered crystalline rocks, which date from a very early period, though, as other regions which are underlain by similar rocks have undergone much folding, the mere presence of these altered foundation-stones is not in itself the whole reason for rigidity.

One of the best examples of a block which has remained rigid for a long period is the area occupied by the Baltic provinces of Russia. There the crystalline rocks are overlain by those ancient sediments known to geologists as the Lower Palæozoic rocks, and these are still horizontal and so little changed that their organisms are beautifully preserved. It is clear that this region has not undergone folding since pre-Cambrian times. Such rigid tracts are not conspicuous in Great Britain. The most striking is that with which we are now concerned, of which North-west Yorkshire forms the southern portion. In this block we find evidence of resistance to the folding-stresses since pre-Carboniferous times, and possibly for a longer period. Let us briefly consider the geological structure of the tract. The greater part of it is occupied by Carboniferous rocks, which are nearly horizontal, though inclined slightly downward to the east. Folding of these rocks is practically non-existent, save locally, though fractures are common, as is the case with similar blocks elsewhere.

Beneath the Carboniferous rocks are the ancient slates of the region, which must be considered rather fully. For the present, however, I wish to insist on the fact that one division of these rocks, known as the Conistone Limestone, follows the border of the block country, on its western and southern sides. It is well known that this block is bounded by three great earth-fractures, namely, the Pennine Fault to the west along its northern extent, the Dent Fault to the north-west along the middle portion, and the Craven Fault to the south, forming its southern boundary. Along the country affected by these faults, the Conistone Limestone can be traced, and it is always underlain by older rocks on the side of the rigid block and succeeded by newer rocks on the sides away from that block. It is clear, then, that a core of rock older than the Conistone Limestone underlies the Carboniferous rocks of the rigid block, and these older rocks are often exposed in the

valley-bottoms which fringe the block. The rocks are of various dates anterior to that of the Coniston Limestone. R. H. Rastall has claimed the old rocks of Ingleton as of pre-Cambrian age, and though this is disputed by J. F. N. Green, I regard the evidence as decidedly in favour of Rastall's views. But an interesting feature of these rocks is the occurrence of pebbles therein, which have been derived from an earlier rock-series. These have been described by Rastall, who draws attention to the frequency of pebbles of schistose and gneissose rocks, similar to those of an Archæan complex. He states that 'the portion of the Archæan complex from which the material of the Ingletonian rocks was derived must have been close at hand. . . . This Archæan massif probably underlies the Pennine area of the north of England at no great depth.' It seems then, that the nucleus of rigid material which is responsible for the rigid block of the northern Pennines is a crystalline mass now buried under the newer sediments ; that over it were deposited later sediments, some probably pre-Cambrian, others of Lower Palæozoic age, and that these were subsequently bent down against the old block, being compressed, and adding to the size of the rigid mass which gradually grew outwards. It is conceivable that such bending occurred at the end of Lower Palæozoic times, leaving these rocks relatively undisturbed over the crystalline nucleus, but the system of fractures which limits the rigid mass must be studied much more fully before this can be determined. The little mass of old rock rising up in Teesdale rather tells against this view, as the rocks appear to be much disturbed.

It is, however, clear that after the deposition of the Carboniferous rocks, no folding of importance took place, for as before stated, the Carboniferous rocks are practically horizontal.

Let us turn now to consideration in further detail of the changes that occurred outside the rigid mass. Evidence as to this is obtainable all along its borders, but is most clearly presented to us in a tract north of Yorkshire along the flanks of Edenside in Westmorland and Cumberland. We have seen that rocks newer than the Coniston Limestone are found in those tracts, so that they were depressed, forming geological troughs of varying degrees of complexity. The hollow fronts of earth-waves broke against the rigid block along its western and southern margins, with the ridges of the waves behind. It is also clear that a similar wave broke against the northern margin, for in Northumberland and the Southern Uplands of Scotland are slate rocks of date posterior to the Coniston Limestone, which latter must therefore turn eastward somewhere between its last northerly appearance on the western side of the Pennines and the outcrop of the later slate rocks to the north. Possibly its trend is somewhat south of Halt-

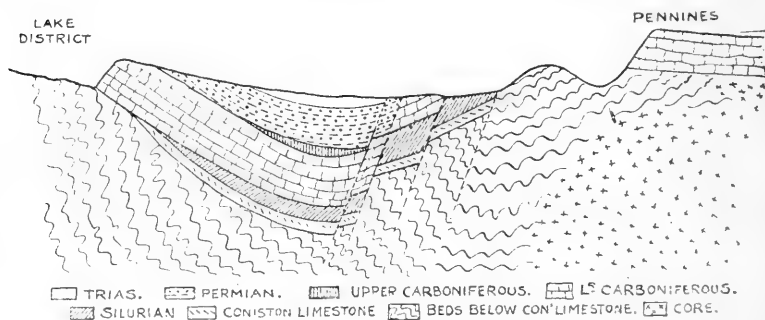
whistle, and to it may be due the disturbed state of the Carboniferous rocks in that district.

How far the rigid block extends in an easterly direction is doubtful. To the north-east, there is considerable folding about the Northumbrian coal-field, but to the south-east, north of Pateley Bridge, the block sinks beneath the Permian rocks of Ripon, and may occur undisturbed some way east of the outcrop of these rocks.

We will now consider the geology of the tract of Edenside in further detail.

This region is a geological syncline, or hollow of an earth wave against the rigid block, which shows proofs of the development of the wave at many geological periods.

The earliest formation of the fold of which we have direct evidence occurred after the formation of the slate rocks, and



Diagrammatic Section across Edenside.

before that of the Carboniferous strata, though, as hinted before, a still earlier movement may have taken place before the Lower Palæozoic slate rocks were deposited. The result of the movement before Carboniferous times was to bend down the Coniston Limestone away from the rigid block, so that older rocks occur to the east of it, and newer ones to the west. The older rocks reappear in the Lake District, so that the Coniston Limestone must come up again from beneath the newest slate rocks on the east side of the Lake District; that is, on the west of the Edenside tract. This geological trough, having been once formed, continued to give along much the same lines again and again. We find the Carboniferous rocks bent down in the same manner as the Coniston Limestone, to the east of Edenside, between Milburn and Melmerby, and they again rise up on the west side of Edenside, so that newer Carboniferous rocks came to the surface in the middle of this depressed tract near Appleby. That this movement was

pre-Permian is shewn by the overstep of the Permian rocks from Lower Carboniferous rocks on to Millstone Grit in the middle of the depression. This has an economic bearing, indicating the possibility of the occurrence of coal at workable depth, beneath the Red Sandstones of Edenside.

It was probably during this period of movement that the extensive sheet of once-molten rock known as the Whin Sill, was forced along the nearly horizontal strata of Carboniferous rocks of the rigid block, and this rigid block is accountable for the existence of this Sill, which, like the block itself, is unique in our county as regards the extent of its areal development.

Next, the red rocks of Permo-Triassic date were laid down, and as shewn by Professor Kendall, movements similar to those which occurred previously, went on during the actual accumulation of these rocks, giving rise to the Pennine Fault, along which motion continued (probably with pauses) until after the accumulation of these red rocks had ceased. This movement, like the others, gave a trough-like arrangement of the red deposits, for the oldest (the Penrith Sandstone) occurs on the west of the trough, and also on the east, being here brought up in several places parallel to the fault fracture, while the newest rocks, the St. Bees Sandstone, are found in the space between.

There was yet later movement of a similar kind, indicated by the occurrence of the little patch of Liassic rocks in the neighbourhood of Carlisle, and as argued elsewhere, this latest movement may even be of Tertiary age. It would appear, therefore, that again and again the earth-wave broke against the western side of the rigid block along its northern extension.

Let us now return to Yorkshire, and consider the nature of the movements at the southern margin of the block, along the line of the Craven system of earth-fractures. As to the exact nature of these fractures, as regards the inclination of the fissures, I need say nothing. It does not affect the rigidity of the block, whether it has been pushed over the rocks to the south, or whether the latter are thrown down along a nearly vertical plane. The general arrangement of the rocks is very like that to the east of Edenside. At Ingleton, the Conistone Limestone is bent down from the older rocks to the north. It is true that as we pass eastward a considerable belt of slate rocks, newer than the Conistone Limestone, lies north of the Craven Faults, but this is in accordance with the view that the rigidity of the block extended outwards from its core, owing to the stiffening of the crust formed of newer rocks, when these were compressed by intense folding. South of the fault system the sunken tract must be underlain by rocks newer than the Conistone Limestone, for some distance,

unless a concealed fold or fracture brings up older rocks just south of the Craven Fault system. Again, as in Edenside, a mass of Lower Carboniferous Limestone is bent down away from the rigid block between the north and south Craven faults. Lastly, as before, we have Permian rocks brought down by the outer fault at Westhouse, the only difference being that the area occupied by these rocks south of the Craven fault is much smaller than that covered by rocks of the same age in the Eden Valley. Apart from this the similarity of conditions in the new areas is remarkably illustrated by Prof. Kendall's researches, for he has proved that the movement along the Craven fault system, like that along the Pennine Fault, was in progress during Permian times.

The earth-waves south of the Craven fault differ in a considerable degree from those west of the Pennine fault. The latter may be compared with the great rollers of the ocean, the former with those of a choppy sea, ridges and troughs alternating rapidly, of varying degrees of magnitude. Are the smallest of these of the nature of eddies swirling on the larger waves? The answer to that may be left to Yorkshire geologists, who will, I feel sure, settle the vexed question as to the origin of the reef-knolls whose structure was originally ascertained by Tiddeman.

The recognisable waves are here breaking obliquely to the southern margin of the block, the directions of these rocks being on the whole north-east and south-west.

The conditions west of the Dent Fault are more complex, but a few words must be devoted to them.

The Coniston Limestone crops out parallel to the fault from Cautley, north-east of Sedbergh, to Dent, where it disappears under the Carboniferous rocks to the east of the fault, but probably runs approximately parallel to it, until the strike swings round where the Dent Fault joins the Craven Faults, north-west of Ingleton. The older rocks lie to the east of the Coniston Limestone, forming part of the rigid block. To the west we have a remarkable set of structures forming a complex trough, with an axis running approximately north and south. The Coniston Limestone occurs on each side of this trough. Its eastern outcrop has already been noticed. Its western one occurs far away near Dalton-in-Furness, where the strata strike again north and south. Between these two outcrops, the slate rocks, newer than the Coniston Limestone, appear; the newest, the Kirkby Moor Flags, in a tract starting at Kendal, and extending southward. The axis of the centre of this trough is roughly north and south, so that the general E.N.E.-W.S.W. strike of the slate rocks of the Lake District is here modified by a subsidiary north and south strike between the rigid block in the east, and a possible similar block to the

west now submerged beneath the sea, though rocks older than the Coniston Limestone are seen near Dalton and at Black Combe. Movement along the same lines recurred later. We find a mass of Carboniferous Limestone running southward from Kendal, with older slate rocks on either side of it.

Though the Craven fault forms the southern limit of the rigid block of North-west Yorkshire, there is no doubt that the movements belonging to the system affect the disturbed rocks far away to the west of that part of the fault-system which bounds the rigid block.

The nature of the rigid block may be summed up in the following words. It is a resistant tract of earth-crust, composed of Carboniferous rocks resting unconformably upon more ancient rocks, the nucleus consisting of crystalline rocks of Archæan type and probably of that age. Around this block the Coniston Limestone has been bent down on the north, west, and south, and possibly to the east, though of this we have no evidence, owing to the covering of newer rocks. Away from the block, on three sides, rocks newer than the Coniston Limestone are found, and are folded in various degrees, owing to earth-stresses acting at various periods. The block itself is surmounted, as stated, by Carboniferous rocks, which are nearly horizontal, though fractured here and there, and affected by an occasional buckling, as between Brough-under-Stainmore and Barnard Castle. The rocks are, however, tilted slightly eastward, and accordingly we are now presented with a tract of country sloping gently to the east and abruptly terminated to the west and south by steep slopes, the fault-scarps. This general condition of rigidity has survived through all the vicissitudes of earth movement, submergence and emergence, deposit and erosion since the beginning of Carboniferous times, and possibly, as far as the core of the block is concerned, from a still earlier date.

Having now dealt with the nature of the block, we may proceed to consider the effect of its existence upon other events. Unique as the structure is as regards Great Britain in its scale and its simplicity, it has given rise to occurrences which are similarly unique in this country.

The river-drainage is generally recognised as an ordinary consequent drainage, the streams running to the east and west from the top of the watershed. Owing to the easterly tilt of the block, the law of unequal slopes is exemplified here, the streams flowing westward with steeper grade, being engaged in capturing the headwaters of those whose courses are in an easterly direction. Some of the details of this have been worked out along that portion which is bounded by the Pennine Fault ; and along the tract east of the Dent fault, it is known that the Clough flowing westward has captured the

headwaters of the Ure. The fault scarp of the Craven system has caused the development of rivers flowing southward from the highlands north of the fault. So far as I know, the somewhat complicated drainage of this tract has not been worked out in detail.

The simplicity of arrangement of the Carboniferous Limestone has caused an underground drainage system of exceptional interest to be developed. Much literature has been devoted to this. So far back as 1871, Sir William Boyd Dawkins gave a detailed account of it in his book 'Cave Hunting,' and now, thanks largely to the members of the Yorkshire Geological Society, we have a mine of information available to the students of Spelæology.

One of the most striking effects of the tract of high ground, with its steep scarp to the west, is its operation as a barrier, affecting both inorganic and organic nature. We may illustrate this by commenting upon its effects upon ice, plants and mankind. We may regard the modern study of its glaciation as dating from the publication of the well-known papers of Tiddeman and Goodchild. They clearly established the importance of the block as presenting a barrier to the easterly movement of the ice coming from the west and north-west. Since then, an important advance in our study of glaciation is due to Kendall's classic paper on glacial overflows in Cleveland. Dwerryhouse has applied the principles to a study of part of the district under consideration, and Kendall himself has recently outlined the events which happened on the western borders overlooking Edenside, where the phenomena are of very great interest. All geologists will look forward with eagerness to the publication in full of his work upon that tract.

But the area had its own ice, and while touching upon glaciation, I may digress for a moment to call attention to one promising line of enquiry. The question of interglacial periods is a vexed one, and so eminent a geologist as Lamplugh from studies in this county, has maintained that there was one period and one only of glaciation. Here he seems to be opposed to the general opinion of geologists at home and abroad. The work of Tarr in the Finger Lake Region of the United States indicated the importance of erosional phenomena as well as of those of accumulation as bearing upon this matter, and he brought forward evidence in that area of an interglacial epoch. In so doing, he called attention to the importance of the simple geological structure of the region in facilitating enquiry. We are dealing with a similarly simple tract, and I think the question may be settled here. Let me mention one bit of evidence. Chapel-le-dale is a simple valley, which seems to owe its general outline finally to glacial erosion; nevertheless, since that outline was produced, water-erosion

has cut a deep channel in the Ingletonian rocks to the north of the town of Ingleton. At the bottom of this channel is in one place an accumulation of boulder-clay, formed subsequently to its erosion. We seem here to get evidence of an important climatic oscillation, though how important can only be settled by detailed work.

Turning now to plant distribution, it is, I believe, generally recognised that the tract has formed a barrier dividing eastern Germanic and western Atlantic assemblages, though here I am speaking of a subject of which I know little.

It is a district where much still remains to be done as regards plant-ecology, Pleistocene and recent. The researches of F. G. Lewis have given us a starting point for the study of Pleistocene plants, and their bearing upon climatic oscillations. The district, owing to its elevation and the abundance of calcareous rock, is exceptionally rich in alpine plants. I was grieved to see the late Dr. J. G. Baker throwing doubts upon the claim of the most beautiful of these, *Gentiana verna*, but still many genuine cases remain.

It is interesting to see the effect which changes in the remote past have exercised upon recent occurrences. I pointed out that the rigid block caused the injection over a wide area of the Whin Sill. The latter produced the saccharoidal limestone, which forms so favourable a soil for xerophilous plants, and accordingly we find *Helianthemum canum*, one of the few native alpine plants with hairy leaves flourishing upon this limestone on Cronkley Fell.

Lastly we may turn to the effects of the rigid block on the distribution of man.

In historic times it has throughout acted more or less effectively as a barrier separating the men of the north-east from those of the north-west, and even in these days of rapid transit, the effects are not entirely obliterated. In prehistoric times, it was probably even more marked. In the border-period, the Neo-celtic type of art linked to that of Ireland seems to be prevalent on the western side. In Neolithic or probably bronze times, the curious ripple-flaking akin to Scandinavian workmanship is confined to East Yorkshire, and certain stone implements of Cumberland and Westmorland have an individual facies.

But though the rigid block has acted as a barrier between east and west, it has had an occupation of its own. It had its own glaciation, its own flora, and its own early human inhabitants, and of the latter there is yet much to be learnt. Was it ever occupied in Palæolithic times? Aurignacian man has been claimed as inhabiting the Victoria Cave, Settle, and it is quite possible that we may ultimately find relics of, at any rate, Upper Palæolithic man.

The district has not yet been searched exhaustively. Some years ago Sir Joseph Prestwich found a flint flake in the deserted pothole below Gaping Ghyll, and I have since found several others of flint and chert, including a very rough flint arrow head, in that pothole. The industry is probably Neolithic. As these objects were found as the result of short search in the earth thrown up by rabbits, I feel that organised excavation in this and other potholes would yield valuable information.

I have touched only on a few points of interest in connection with the rigid block. To me, as to others, it is an area of extraordinary fascination. This is increased if, standing on some prominent height such as Ingleborough, we view in imagination the earth waves from north, west and south breaking through long geological ages against this stable mass, which is not only a part of the backbone of England, but at any rate, in the geological sense, the very core of Yorkshire.

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Unusual Capture of a Big Yorkshire Salmon.—A fine Salmon was caught in the Esk last November. It was a cock fish, weighing 29 lbs., with a length of 3-ft. 9 ins., and a girth of $22\frac{1}{2}$ ins. It was hooked by Capt. J. G. Soulsby when bottom fishing, but after playing it for 25 minutes the line broke and the fish sailed away with the float, hook and 8 yards of line. In the afternoon, 4 hours after the fish broke away, the float was observed in the stream. Mr. James Schofield cast a 'Devon' minnow across and succeeded in catching the gut underneath the float, and after a vigorous 35 minutes fight, succeeded in landing the fish.—R. FORTUNE.

Sturgeon at Scarborough.—On November 22nd, a large Sturgeon was landed at Scarborough by the Steam Trawler 'Strathavon.' Measuring 12 ft. in length, with a weight of 25 stones, it was larger than the majority of North Sea specimens. It was sold by auction for £16 6s. A smaller example was recently landed at Bridlington. (See *The Naturalist*, Nov., 1920, p. 372). Another Sturgeon, taken in the nets of the Steam Trawler 'Renaissance,' was landed at Scarborough on December 2nd. It was much smaller than the one captured a few days previously, and weighed three stones. On December 22nd a Sturgeon, 7 ft. long, was landed at Scarborough by the S.S. 'Champion.' This is the third recently landed at this port, others have been landed at Bridlington and Yarmouth, pointing to a small immigration of these fish into the North Sea.—W. J. CLARKE, F.Z.S., Scarborough.

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We notice among the recent additions to the Victoria and Albert Museum, London, is a 'Thirteenth century church door with some good iron work on it, from Dunnington, Yorkshire.'

R. FORTUNE, F.Z.S.

IN a recently published book, 'Habits and Characters of British Wild Animals,' by Mr. H. Mortimer Batten, is the following interesting paragraph in the chapter devoted to 'The Pine-Marten.' 'The only wild marten I have ever seen in a natural state lived in some low crags in the heart of a beech wood in a secluded West Riding Valley. I saw it on two occasions, and each time its behaviour was identical. As I silently approached the foot of the crags, it darted from a cranny somewhere among the heather and ferns at the brow of the cliff, and ran up the slanting trunk of a blasted mountain ash, growing from a shelf. Here it crouched, tilting its head, now on one side, then on the other, as it regarded me with an air of playful innocence. One could not but be struck by its exquisite beauty. A picture, indeed, amidst its rugged setting; yet in those bright eyes was a hint—the merest hint—of the devilish brain which commanded that death-darting body. After a few seconds of closest scrutiny it descended the trunk a little, as though to obtain a better view; then, like a flash, it was gone.'

In reply to an enquiry, Mr. Batten kindly wrote as follows: 'It was in January, 1914 I saw the Pine Marten. The animal was in the wood Garolgone, about a mile and a quarter from Burnsall village, on the down river side, left-hand bank facing up. This is a hardwood forest, closely adjoined by extensive coniferous forests, which cover the mountain side for several miles. Garolgone is very densely timbered; the undergrowth is of bracken, briar and hazel, overhanging loose boulders of all sizes, thus forming an ideal shelter for wild life of every kind. It has always harboured a very large number of rabbits. They are bred in the lowland pastures, and make their way into these woods as summer proceeds.

In the very centre of the wood is a low cliff of loose formation, overshadowed by trees, and overgrown by ferns. The marten, so far as I can judge, had its home in this cliff, and on being disturbed, it would mount into a mountain ash, growing from the face of the cliff, and thence by means of two or three leaps, would gain the brow of the cliff and disappear. This wood, incidentally, is an ideal hunting ground for any naturalist, as it generally contains a few rare birds, and I have no doubt the marten was drawn there by the superabundance of rabbits and squirrels.'

With reference to Mr. St. Quintin's note upon the Barmston Pine Marten in *The Naturalist*, it is only fair to the Vertebrate Section to say that they did not have this animal before them, but merely a report which was emphatically 'turned down' by East Riding members, who themselves had been deceived by a third party who *had* seen it, and reported adversely.

GEASTER RUFESCENS PERS. IN YORKSHIRE.

F. A. MASON, F.R.M.S.

DURING the visit of members of the Yorkshire Naturalists' Union to the Valley of Desolation, Bolton Woods, in connexion with the work on Rivers Investigation, on December 11th, 1920, Mr. R. W. Butcher, of Leeds, collected a specimen of the above named gasteromycete. According to Massee and Crossland's 'Fungus Flora of Yorkshire,' 1905, *G. rufescens* has only once been recorded for this County (Boynton, N.E. Div.), but the record is left unnumbered, is inserted in square brackets, and is qualified by the remark 'a doubtful species.' I communicated with Mr. A. Clarke, who confirmed the identification, and kindly gave me the opportunity of looking through some unpublished notes of the late Charles Crossland referring to this species, from which it is evident that a second specimen has been found in the S.W. Division. Remarks on the latter are accompanied by a note which throws light on the Boynton record and dispenses the uncertainty cast upon the occurrence of this species in Yorkshire.

In the year 1907 Crossland received a geaster collected by H. Lawson on bare soil, under sycamore trees, in the grounds of Mr. Whitley Thompson, Skircourt, Halifax, October 22nd, the identity of which, he was in doubt. Crossland says: 'This was submitted to C. G. Lloyd, of Cincinnati, U.S.A. . . . who says the species is *G. rufescens* Pers., so that this will confirm the Boynton record for Yorkshire.'

In a further note with regard to the Halifax specimen, he says: 'I considered this to be *G. fimbriatus* and entered it as such in the Halifax records for 1907. This, however, must be altered, as on submitting the specimen to C. G. Lloyd, he declared it to be *G. rufescens*. There was only one found. There is only one previous record for Yorkshire (Boynton—W. W. Strickland, *The Naturalist*, July, 1889), and this, at the time the Yorkshire Fungus Flora was compiled, was considered doubtful and left unnumbered; glad to confirm this solitary Yorkshire Record.'

Judging from descriptions and from published drawings *G. rufescens* is a variable species. The Bolton specimen agrees well with the figure in *Grevillea* II., 1873, Pl. XIX., and in its more shrivelled condition the appearance of the exoperidium corresponds perfectly with C. G. Lloyd's photograph in '*The Geastrac*.' In that photograph, the endoperidium is pedicelately attached to the exoperidium, while in the Bolton specimen the endoperidium is sessile, and it is recognised that both forms occur. C. Rea, in *Trans. Brit. Mycol. Soc.*, Vol. III., 1911-1912, p. 352, writing of this species, says 'it has the inner layer

of the exoperidium of a *reddish flesh* colour, and this layer is some four or five millimetres in thickness when the plant is quite fresh, but when it becomes weakened this layer often breaks away in flakes and dries up almost completely, with the result that very little of it can be detected in worn out specimens. . . . Most books describe the mouth of the endoperidium as toothed, whereas, in fact, it is only occasionally torn, and too much importance has been attached to this character.' In the Bolton example, the mouth is distinctly denticulate. Rea gives the spore measurements as 4μ diam., and the capillitium threads $6-7\mu$, and in the case of the specimen under discussion, the measurements are practically identical; spores $4-4.4\mu$, and capillitium threads $6-8\mu$, with occasional thicker threads of 9μ diam.

G. rufescens Pers. is new to Mid. W. Div. (V.C. 64), and its discovery has served a useful purpose in clearing up a doubtful point in the County records.

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Swan Songs, by **Dudley Harbron**. A. Brown & Sons, 25 pp., 2/6 net. The author, who is presumably a young man, seems rather fond of wanting to 'expire.' He concludes one sonnet by 'And let me then expire,' in another he says 'Give me your soul entire, and if it please God, let us then expire.' Hence, presumably, 'Swan Songs.' He seems to be a devout disciple of Ibsen, or he has early been crossed in love. When he is twice his present age, his poems—for they are poetry—will be much more cheerful. By then he will find that life is 'worth while.' If we are here in 1940, we shall look forward to reading his 'Joy Songs.'

Highways and Byways in Northumbria, by **P. Anderson Graham**. Macmillan & Co., 380 pp., 7/6 net. This is a particularly charming and healthy book, written by one who knows the county he describes, and illustrated by Hugh Thomson, an artist of exceptional ability. His numerous sketches, reproduced as if they were pencil drawings in the book, are very fine indeed. The author acknowledges his indebtedness to the Proceedings of the Berwickshire Naturalists' Club and *Archaeologia Aeliana*—with both of which publications he is evidently familiar. We do not remember enjoying a book so much since we read the same publishers' 'Forty Years in a Moorland Parish,' by the late Canon Atkinson.

Les Insectes: Introduction à l'étude de l'Entomologie biologique, par **Constant Houbert**, 2^e édition revue et corrigée. Un vol. in-18 Jésus, de 380 pages, avec 207 gravures dans le texte. Broché, 8 fr.; cartonné toile, 10 fr. Gaston Doin: 8 place de l'Odéon, Paris (6^e). Le livre de M. Houbert contient un résumé complet de l'Entomologie jusqu'à nos jours, donnant une définition précise du type 'Insecte,' et exposant d'une façon concise et claire l'ensemble de nos connaissances sur l'anatomie, la physiologie et la biologie des insectes. Nous voudrions signaler surtout les chapitres intéressants concernant la nervation des ailes, la parthénogénèse, et la classification et la biologie des larves. La 3^e partie de l'ouvrage renferme plusieurs chapitres intéressants, e.g., Les Insectes dans les temps Géologiques, Moyens de défense chez les Insectes, Distribution géographique des Insectes. M. Houbert termine par des considérations générales sur le parasitisme. Le livre est bien illustré, contenant 207 figures dans le texte.

GEOLOGY.

Remains of Elephas in East Yorkshire.—The photograph reproduced herewith shows three teeth and a portion of a tusk of a mammoth (*Elephas primigenius*). The two smaller teeth and the tusk have recently been purchased for the Hull Museum collection, and have been found in the vicinity of Barmston, by Mr. Allison. The tusk is a fine example, in good preservation, and measures 2 ft. 8 ins. in length, and 13 ins. in circumference. The large central tooth is from the Burstwick gravel pit in Holderness, and has been inserted in the photograph in order to illustrate the unusually small size of a Mammoth tooth appearing just above it. This is evidently one of the small teeth occasionally found at the far end of the lower jaw. It is perfectly formed, and has been well used, the grinding surface measuring 2 ins. by $1\frac{1}{2}$ ins.,



and it weighs two ozs. The tooth shown at the top left hand corner is broken and has no grinding surface. It measures 8 ins. in length by 3 ins. in width, and weighs two lbs.—T. SHEPPARD.

Coast Erosion in Holderness.—In *The Naturalist* for 1911, p. 381, measurements were published showing the loss of land at four points at Aldbrough, East Yorkshire, during a period of eighteen years. The distances of these points from the edge of the cliff were again measured in September, 1920, with the following result :—

	Aug., 1893	Jan., 1901	Aug., 1911	Sept., 1920
A	63 yds.	50 yds. 1 ft.	$34\frac{1}{2}$ yds.	28 yds.
B	48 yds. 2 ft.	39 yds. 1 ft.	37 yds. 1 ft.	29 yds. 1 ft.
C	52 yds. 1 ft.	41 yds.	30 yds.	22 yds.
D	—	90 yds.	70 yds.	59 yds.

D is now known as Cliff House.—T. PETCH.

MAMMALS.

Late Breeding of Hedgehog in Holderness.—I found a female Hedgehog with five young, each about the size of a tennis ball, in a long plantation near Halsham on November 13th, 1920.—C. F. PROCTOR.

Hedgehog in a Strange Locality.—A sister-in-law of mine who lives in the South of London writes that late in November she was surprised to see a Hedgehog walking up the garden path, attended by a big yellow cat, which did not seem to know what to make of the strange visitor. The cat tried to pat the Hedgehog, who promptly rolled himself up; after a time the cat left it and went into a neighbouring garden, returning with a special 'pal,' and eventually being reinforced by nine or ten more cats, which formed a ring round the hedgehog, first one and then another venturing a pat. Being unable to make any impression upon the armour, they one by one departed, leaving only one cat in attendance. The Hedgehog finally burrowed under a heap of rubbish, and this cat was last seen watching the hole where 'piggy' had disappeared. A van full of furniture had arrived at a neighbouring house the day before from the New Forest neighbourhood, and it is quite possible the visitor had reached London in it.—R. FORTUNE.

Habits of Water Vole in Suffolk.—Last summer I found it necessary to spend several months in the county of Suffolk. The part of the county where I was is watered by the river Stour, a typical English stream, slow and sluggish, with thick beds of rushes and reeds on each side. Considerable numbers of Voles, or Water Rats as they are commonly called, lived in the banks of the river. I often spent the summer evenings by the side of the stream, and I took great pleasure in observing the habits of these interesting little animals. They frequently sat on bunches of reeds floating on the surface of the river, feeding on the stalks, which seemed to be their only food. On the slightest alarm they dived through the reeds and disappeared. They did not slide away, as most animals do when diving, but plunged in head first, quite perpendicularly. I never could see one under the water, which was generally discoloured, with rushes or reeds floating on the top. On many occasions, however, I saw them swimming on the surface of the water while crossing from one side to the other, or when looking for food. While so doing, I observed that they only used their hind legs as a means of propulsion, moving them alternately as in walking, their forelegs being pressed down to their sides, their bodies were very high out of the water, almost wholly exposed. I have consulted several Natural History books to see if this peculiarity in the swimming

of the Vole is noticed, but I can find no mention of it, save in Lydekker's 'Handbook of British Mammals,' where he cites Trevor-Battye as having noticed the same thing. The Water Vole is unknown in Ireland, so far as I am aware.—G. C. MAY, 13 Fitzwilliam Square, Dublin, November 27th, 1920.

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BIRDS.

Late Stay of Swift.—I watched one flying round, at Devonshire Park, Keighley, on November 7th, 1920, A strong South-east wind had been blowing for a week.—E. J. S. CRAVEN.

Black Redstart at Whitby.—On New Year's Day I heard of a Redstart being seen at the foot of the East Cliff, near the beach. I visited the place, and on January 4th had ample opportunities of identifying it as a Black Redstart, in female plumage. On subsequent dates I had the bird under observation. It is nearly twenty years since the last record of this bird came under notice here.—F. SNOWDON, Whitby.

Late Willow Warbler at Bolton Abbey.—On the morning of Saturday, November 27th, I was surprised to see a Willow Warbler in the gardens here. It was diligently searching some rose trees for food, and I was able to approach within nine feet. There were no other birds in its company, except some Robins near by. A search later in the day failed to trace it. In Nelsons 'Birds of Yorkshire,' there is a record, of precisely the same date, in 1893.—THOMAS ROOSE.

Swallow near Whitby in December.—During bright, genial, spring-like weather on December 29th and 30th, a male swallow was observed on the wing for several hours, near River Garden, at Sleights, near Whitby. Eventually it flew into the Station Hotel, Sleights, where it was kept alive some time.—F. SNOWDON, Whitby.

The bird was kept alive for a short time by the landlord of the hotel, but, as might be expected, soon died. The body was presented to the Whitby Museum for preservation.—R.F.

Gannet with Abnormal Eyes.—It is interesting to learn from Mr. Andrew White, lighthouse keeper on the Bass Rock, that the Gannet with the abnormal black eyes, which we saw and photographed in August, 1914 (see *The Naturalist*, October, 1914, p. 315), and which we christened 'Black-eyed Susan,' has again turned up. In the interval between 1914-20 she has not been seen, but of course may have nested in some other part of the rock; this last season she has returned to her old place and was found nesting within 3 feet of the 1914 site.—R. FORTUNE.

Great Northern Diver at Castleton in Cleveland.—On November 1st a Great Northern Diver was captured in an exhausted state in a small stream near Castleton in Cleveland, which is twelve miles from the sea. The bird had no visible injury, nor was it in poor condition, neither had there been any October gales which might have driven it so far inland. Possibly it may have got lost in some of the dense fogs which prevailed at the time. Dr. Chalmers, of Castleton, acquired the bird, and has preserved and set up the skin. It was a very handsome adult male in nearly complete summer plumage, measured thirty-one inches in length, spread of wings fifty-two inches, weight exactly six pounds.—F. SNOWDON, Whitby.

Little Auk at Barmby Moor, near Pocklington.—A Little Auk in a very exhausted condition was picked up on the farm of Mr. A. Richardson, on November 23rd, 1920. This bird, which had evidently become lost in the fog prevailing at that date, was placed on a pond, but died during the night. I saw it just before it was sent to Messrs. Allen, of York, to be stuffed.—SYDNEY H. SMITH.

A correspondent in *The Yorkshire Post* of November 30th records another specimen at Wrelton, near Pickering, and in the same paper for December 4th is a record of three specimens obtained in the valley of the Ure in February, 1916, 'one at West Witton, alive, but very done up; one at Appersett, and one near Honeycott, above Hawes. These were both dead. There was a snowstorm with easterly gale at the time.'—R.F.

Behaviour of Hobby in Kent.—This bird acted very differently on occasions here during 1919, which showed that no hard and fast dogmatic statement can be applied to its behaviour. When standing near a hedge, one passed me and settled on the ground about five yards away and waited about four minutes opposite where some Sparrows were in the hedge. As these showed no signs of emerging, it flew quietly down the hedge and then over a field. On this occasion it could not fail to have seen me as it looked at me several times, but showed no alarm. Later on, a Hobby behaved very differently as it always took flight as soon as it saw me, even though 20-35 yards away and without a gun. Later still in the year, I saw a Hobby at a distance walking on the ground among some fruit trees, and approached to see what it was doing. Although I had no gun at the time, the Hobby now hid itself behind a bush on seeing me approach, and remained hidden for a time while I was looking about to see where it had got. After searching about, it finally flew out close to me and made rapidly over the fields beyond. It is, of course, impossible to be certain whether this was the same individual on all occasions, but there was no doubt about the species. Com-

paring the flight of the Hobby with the flight of the Kestrel (mentioned in *The Naturalist*, 1918, p. 301), there was less flapping of wing with the former when flying quickly.—FREDERICK D. WELCH.

We trust that if Mr. Welch had had a gun with him the bird would not have been in danger.—ED.

Golden Eagle in Lincolnshire.—In *The Shooting Times* of December 4th there is recorded the capture of an Eagle, said to be a Golden Eagle, but which will 'probably turn out to be a Fish Eagle.' It was caught by Mr. W. A. Lindsey at Spilsby, in Lincolnshire. According to its captor, 'The bird had been seen in the neighbourhood at a great height for the past fortnight, and it was picked up in a dazed condition.' It showed no trace of injury when picked up, and made a complete recovery from whatever cause had brought it low. It was then packed off to the Zoological Society, where it is said to have 'made a hearty meal of a number of dead rats soon after its arrival.' As there seemed to be some uncertainty with regard to this record, I wrote to Mr. D. Seth Smith for confirmation or otherwise. He states that it is undoubtedly a Golden and not a White-tailed Eagle, a bird of the year.—R. FORTUNE.

Golden Eagle in West Yorkshire.—Hearing that for a week or two an Eagle had frequented one of the wildest stretches of moorland on the outskirts of the West Riding, I paid the district a visit on January 1st. At noon, when some miles beyond the last habitation, and well among the hills, a party of grouse was seen hurriedly to leave the top of a hill above. Other grouse, too, seemed to have taken a sudden dislike to the neighbourhood, and flew across the valley; and shortly afterwards a Golden Eagle sailed over the rim of the hill and into the field of my binoculars. The bird did not remain long in view, but curved round behind the hill again. Its course, which lay parallel with our return journey, could be traced by the grouse which continued to leave the hill-tops. Occasionally the eagle was in view for a few seconds, but soon got well ahead of us. Over the top of the last hill—the end of its usual beat, than which I was told it had not yet been seen to approach nearer to civilization—the eagle was seen to be circling, attended by some crows, as we drew nearer. The crows had doubtless risen from carrion as the great bird approached, and the appearance of the two species in close proximity was a considerable help to the realization of size. The wingspread of the eagle appeared from four to five times as large as that of the crows, but the greater ease in turning of the smaller birds enabled them to keep out of the 'monarch's' clutches. Eventually the crows flew away, and after we were well past the hill, the

eagle turned north again, sailing along with very occasional beats of the wings. When observing through glasses, daylight could often be seen through the tips of the primaries. I am told it is thirty years since the species was known to visit the district—to meet with a charge of shot. It is to be hoped the present distinguished visitor will not share the same fate. Except for one occasion, when it was surprised on the ground, the keepers say it keeps well out of their way. Some ‘castings,’ which have been found and examined, contained remains of rabbit and sheep, the latter doubtless being carrion.—RALPH CHISLETT.

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MOLLUSCA.

Early Mollusca at Selby.—Passing through my garden on the morning of January 2nd, I was surprised to see on plants of *Barbarea* and Parsley, examples of *Arion circumscriptus*, *A. hortensis* and *Agriolimax agrestis* (pale form) in the act of crawling, *circumscriptus* being the most lively, and *agrestis* the least: I secured 18 altogether. The lowest temperature reading during the previous night was 48° Fahr., with rain. The mild spell of weather was doubtless responsible for these early appearances.—J. F. MUSHAM.

Early Mollusca in Lincolnshire.—In spite of the heavy fall of snow and keen frost on and about December 12th, I observed *Arion hortensis* on Christmas Day crawling about on a mossy gravestone in Raithby churchyard. On Boxing Day considerable numbers of *Agriolimax agrestis* were crawling about the roadway near Stanmore Hill. On January 2nd I noted three *Amalia sowerbyi* on the footpath, Horncastle Road, Louth; and near the railway bridge, at the foot of Stanmore Hill, I found one example of *Arion circumscriptus*, also two or three typical *Agriolimax agrestis*, and beyond Stanmore Hill a considerable number again of *A. agrestis*, the majority, as on Boxing Day, being referable to var. *reticulata*.—C. S. CARTER, Louth, January 2nd, 1921.

Lincolnshire Land and Freshwater Mollusca.—I received from Mr. J. F. Musham, on the 18th December, 1920, a number of shells, kindly named by Mr. Charles Oldham, which I had collected at various places. A new county record for Division 5 E., is *Pisidium personatum*, taken at Grayingham, in the Rector's little pasture pond, lying on Upper-Lias-Clay, with a slight covering of Lower Estuarine, from which its water oozes, visited at times by snipe, and water-hens bred here this summer, 27th August, 1920. The following are new divisional records for Lincolnshire. From the same pond as the above, *P. casertanum*. From Cadney, Division 3 S.W., *P. milium* and *Sphærium lacustre*, taken

from two ponds not far apart, both on Chalky-Boulder-Clay ; wild ducks and water-hens visited 24th December, 1917. All the three ponds referred to in summer have a fauna of water-beetles.—T. W. WOODRUFFE-PEACOCK, Grayingham, Kirton-in-Lindsey.

Early Mollusca in Yorkshire and Lincolnshire.—The preceding records emphasize the indifference to cold of the slugs generally, few or none of the species being close hibernants, and contrast strikingly with the keen sensitiveness to cold of the thick-shelled *Helices* as *Helix aspersa*, *H. pomatia*, etc. The occurrence of the pale and reticulate forms of *Agriolimax agrestis* may probably be ascribed to the comparatively mild winter we have so far enjoyed, as according to many keen observers *A. agrestis* tends to darken at the fall of the year, a circumstance ascribed to the usually moister conditions and lower temperature. Mr. Peacock's notes on the occurrence of *Pisidium casertanum* and *P. personatum* are welcome, but it is a matter for regret that the name *casertanum* continues to be employed, for not only is there no certainty that the identification with Poli's species is correct, but the description given by Poli is very vague and unsatisfactory, and the name being polynomial is inadmissible. The finding of *P. casertanum* and *P. personatum* in the same restricted habitation is also interesting, in view of the possibility of their being only the forms of a single species.—JNO. W. TAYLOR.

***Helix* (*Acanthinula*) *lamellata*, Jeffreys, var. *albina*, nov. var.**—*Shell*, white or whitish. This form has been noticed constantly during the last five years in a shadow cliff (and neighbour of this) near Rya Åsar (ridge) at Borås, Westergötland, Sweden, by Mr. Berthold Sundler, to whom I am greatly indebted for forwarding the specimens. Mr. Sundler says that the albino form occurs there in great numbers, while the typical is rather scarce.—HANS SCHLESCH, Seydisfjord, Iceland.

The record of the abundance of Albine *Acanthinula lamellata* is worthy of note ; such occurrences are very generally accepted as one of the indications that the species thus affected is nearing the limit of its geographical or altitudinal range. *A. lamellata* stands alone amongst British species, in that the animal, though possessing well developed hermaphrodite glands, producing ova and spermatozoa, yet is quite without the male copulatory organ in all the specimens hitherto examined. Self-fertilization or the extrusion of the terminal end of the free oviduct as an intromittent organ as in certain slugs have been suggested as explanatory of the assumed absence of the male organ.—JNO. W. TAYLOR.

INSECTS.

Phibalapteryx lapidata in Yorkshire.—In a sale at Stevens' Sale Rooms some time ago, the following was included from the collection of the Honourable R. Bethell: 'Lapidata 1, Upper Teesdale, Yorks., Honourable R. Bethell.' I think this is worth being put on record, as the species is not included in the Yorkshire list, and it is recorded for a part of the county which is practically unworked, and which, from its interesting Alpine flora, should be worth closer investigation.—T. ASHTON LOFTHOUSE, Middlesbrough.

Mochlonyx velutinus Ruthé in Yorkshire.—Whilst searching for Anopheline larvæ at Austwick Moss, on October 23rd last, larvæ agreeing with the description of *Mochlonyx* larvæ were found in two or three pools, several were brought home and a ♀ and ♂ emerged on January 3rd. They belong to the above species, and are an interesting addition to the Yorkshire list. Mr. Edwards suggests that they are rarely taken as flies, but more frequently as larvæ, owing to their flight being short in duration and early in the year.—CHRIS. A. CHEETHAM.

Lancashire and Cheshire Entomology.—At a recent meeting of the Lancashire and Cheshire Entomological Society Mr. S. P. Doudney shewed *Macaria notata*, *Eupithecia plumbeolata*, *Lobophora halterata* and *Melanippe hastata* from Burnt Wood; *Argynnis cydippe* from Arnside, and from Holker; *Plebeius aegon*, *Coenonympha tiphon* and *Carsia paludata*. The Rev. F. M. B. Carr had a specimen of *Hesperia malvae* from Delamere, this being a new record for Lancashire and Cheshire, also a specimen of *Argynnis cydippe*, a species which had not been recorded for Cheshire for many years, although common in N. Lancs. Other interesting species in Mr. Carr's exhibit were *Xanthia gilvago*, Chester; some very dark *Oporabia dilutata*, Alvanley; and fine varied series of *Noctua glareosa* and *Himera pennaria* from Delamere Forest. Mr. S. Gordon Smith shewed long and varied series of *Melanargia galatea* from Market Risborough; two fine aberrations of *Cymatophora flavicornis*, a fine varied series of *Nyssia hispidaria*, including quite black forms, and a series of *Noctua castanea* var. *neglecta* from Delamere. By using electric light at Chester, Mr. Smith added *Halia brunnecata* (2) to the Lancashire and Cheshire list, by the same method he had also taken a fine black variety of *Acronycta alni*, he also showed a fine aberration of *Odonestis potatoria*, a female having normal male colouring. Mr. W. Mansbridge exhibited from Crosby sandhills two examples of *Coenonympha pamphilus* which were without the usual black spot on the forewings; also four specimens of *Sarrothripus revayana* from North Lancashire.—WM. MANSBRIDGE, Hon. Sec.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from *The Naturalist* for 1920, p. 388).

Gen. *Epeira* Walck., 8-20.*

E. pyramidata Clerck.

Uncommon and of local distribution in Gt. Britain, and absent from Ireland, but usually plentiful where found. *Adult* summer and autumn. First record—*Scientific Opinion*, Bishop Wood, October 13th, 1869, Vol. II., p. 421.

- V.C. 64.—Bishop Wood, J. Grassham; also C. Smethurst, *Naturalist*, January, 1880; many examples on trees, mostly immature, Y.N.U., 1715, in same wood; Grass Woods, 1 ♀, from hazel, J. W. Carter; Dalton Lane (Bramham), many examples from larch.

E. cucurbitina Clerck.

Widely distributed in the British Isles, Europe and Asia, and usually common; beaten from bushes and the lower branches of trees. *Adult* May to August. First occurrence—the author, Dalton Lane, May, 1903.

- V.C. 61.—Hessle Cliffs, H.C.D.; Bubwith, J.F.; Hesslewood, E.A.P.; Riccall Common, N. Ferriby, Birkhill Wood (Cottingham), Houghton Woods (Market Weighton), Deepdale Woods (Beverley), Leconfield, T.S.; Rillington; Scampston.

- V.C. 62.—'Very common on various shrubs throughout the low-lying grounds at the northern base of the Cleveland Hills,' J.W.H.; Hayburn Wyke, T.S.

- V.C. 63.—Campsall; Askern; Bishop Wood; Bentley Springs, near Wakefield.

- V.C. 64.—Shipley Glen, Burley-in-Wharfedale, W.P.W.; Saltaire Park, J. W. Thorpe; Bolton Woods; Adel; Harewood; E. Keswick; Woodhall; Dalton Lane; Chandler's Whin and Askham Bog.

- V.C. 65.—Hawes Junction, W.P.W.; Aysgarth.

E. diademata Clerck.

The 'garden' or 'cross' spider, very common and of Holarctic distribution; amongst vegetation, or in the hilly districts on walls, variable in coloration according to habitat. *Adult* summer and autumn. First record—Specimens from Barwick in Elmet shown to Leeds Nat. Club, September 15th, 1874.

- V.C. 61, 62, 63, 64.—Very widely diffused and recorded stations very numerous.

E. sturmi Hahn.

Until 1908 confounded in England with *E. triguttata* Fabr. The present species occurs in the north of England and in Scotland; *triguttata* in the south of this country. Beaten from the branches of trees, especially pines, firs and yews. *Adult* in May and June. First occurrence—the author, Dalton Lane, June, 1905.

- V.C. 61.—Houghton Woods (Market Weighton), 2 ♀s, T.S.; Escrick, J.F.; Riccall Common, both sexes; Scampston, 1 ♀.

- V.C. 63.—Cawthorn, Deffer Wood, ♀ and many immature examples; Clough House Wood (Slaithwaite), 1 adult ♂ from grass surrounding an embedded stone.

* *Epeira angulata* recorded by C. Smethurst, *Naturalist*, January, 1880, as from Bishop Wood, I take to be an error.

- V.C. 64.—Harewood Park, immature examples on yews by the mere ; Dalton Lane, immature examples on larch ; Bishop Wood, immature ♀.

Epeira umbratica Clerck.

Widely distributed in the British Isles and on the Continent ; beneath decayed bark of trees, in cracks of wooden fences, gate-posts, etc., or within buildings. *Adult* throughout the year. First occurrence—W. D. Roebuck, Pannal, 1868, *Naturalist*, December, 1881.

- V.C. 61.—Hornsea Mere, 1 ♀, A. C. Willford ; Waudby Green, Risby, Bielsbeck, Weedley Springs, T.S. ; Ellerby, females, J. Porter.
 V.C. 62.—Suffield, ♀ received for identification early in 1906, R.G. ; Great Ayton, G.B.W. ; near Middlesbrough, Gt. Ayton and Lonsdale, very common, J.W.H. ; Seamer, R.A.T. ; Beast Undercliff, Staintondale, T.S.
 V.C. 63.—Y.N.U., Cannon Park Hall, near ponds.
 V.C. 64.—Denton, 1 ♀, J. Ashworth ; Bishop Wood, T.S.

E. quadrata Clerck.

Widely distributed in the British Isles and on the Continent ; somewhat local but usually abundant where found. *Adult* July to October. First record—J. Grassham, Bishop Wood, *The Naturalist*, 1878, p. 44.

- V.C. 61.—Allerthorpe Common, near Pocklington, T. Sheppard, *The Naturalist*, Sept., 1905, p. 269 ; Spurn, E.A.P., T.S. ; Kelsey Hill, Weedley, 2 ♂s, 1 ♀, T.S.
 V.C. 62.—Cleveland, 'every locality visited,' Whitby, Middlesbrough, sparingly on the moors, J.W.H.
 V.C. 64.—Bishop Wood, ♀, J.G. ; also C. Smethurst, *Naturalist*, January, 1880.

E. cornuta Clerck.

Widely distributed in the British Isles, Europe and Central Asia ; on grass, furze, heather and other bushes ; usually common. *Adult* in summer and autumn. First occurrence—the author, Linton Common, June, 1905.

- V.C. 61.—Bielsbeck, Deepdale Woods (Beverley), Stone Creek, Patrington Haven, Kelsey Hill, Welwick, T.S. ; Spurn and Cherry Cob Sands, E.A.P. ; Sutton, E.A.P., T.S. ; Driffeld, H.C.D. ; Rillington.
 V.C. 62.—Middlesbrough district, 'not uncommon in suitable places,' J.W.H. ; Cayton Bay, R.A.T. ; Filey, T.S.
 V.C. 63.—Keighley Moor, R.B. ; Wadsworth Moor, near Hebden Bridge, D. Sutcliffe, both sexes.
 V.C. 64.—Morton Moor, W.P.W. ; Rivock, R.B. ; Winterburn, A. H. Lumby ; Linton Common.
 V.C. 65.—Near Hawes Junction, W.P.W. ; Aysgarth.

E. patagiata Clerck.

Rarer and more local than the last, but with a wide range in Britain (Dorset to Moray), rare also in Ireland ; abroad, widely distributed in Europe ; on bushes, furze, etc. *Adult* May to September. First record—H. C. Drake, Humber Bank East, 1908.

- V.C. 61.—Humber Bank East, immature ♀, H.C.D. (*Trans. Hull Field Club*, 1908) ; Kelsey Hill, E.A.P. and Pulfin Bog, Beverley (H.M.P., No. 59) ; Sutton Drain Bank, T.S. ; Skipwith Common, on furze near the mere, adults of both sexes, W.P.W., W.F.

Fam. MIMETIDÆ, 2-3.

Gen. *Ero* C. L. Koch, 2-3.*E. furcata* Vill. (*E. thoracica* Wid.).

Widely distributed in the British Isles and on the Continent, occurring also in the Azores and N. America; amongst grass, heather and other herbage. *Adult* in spring and summer. First record—Yorkshire, S.G.B.I., sub *Theridion variegatum* Bl; Bradford, R.H.M. (V.C.H.). Widely but thinly scattered through the county.

V.C. 61.—Brantingham Dale, Bridlington, Bielsbeck, Sand-le-mere, Houghton Woods, King's Mill Marsh (Driffild), Cottingham, Riplingham, Spurn, Kilnsea, T.S.; Selby; Riccall Common; Scampston.

V.C. 62.—Eston and Ayton, 'common,' J.W.H.; Boosbeck; Kilton Woods; Marske; Cayton Bay; Ringingkeld Bog; Hayburn Wyke; Ravenscar; Levisham.

V.C. 63.—Bradford, R.H.M.; Harden, Beckfoot, Shipley, W.P.W.; Maltby; Deffer Wood (Cawthorn); Fenay Bridge; woods near Huddersfield (Butternab, Honley Old, Woodsome, Savile and Dean Woods); Sun Dean.

V.C. 64.—Howden Ghyll, Shipley Glen, W.P.W.; Wharfedale, Bolton Woods to Boston Spa; Stubbing Moor; E. Rigton; Adel Moor and King Wood; Alwoodley; Chandler's Whin (York); Sawley district; Knaresborough; Hackfall; Giggleswick.

E. cambridgii Kulcz.

Separated from English examples of *E. furcata* Vill. by Prof. Kulczynski, 'Fragmenta Arachnologica, No. IX.', Jan., 1911, pp. 61-2; since recognised in Dorset, New Forest, Staffs., Wicken Fen, Cheshire, Cumberland and Northumberland. Season as in the last. The two species are the makers of the graceful long-stalked balloon-shaped eggsacs attached to the stems of low vegetation or the under surface of stones.

V.C. 62.—Cliffs, west of Marske, 3 ♀s, Aug., 1910.

Fam. THOMISIDÆ, 16-40.

Sub-fam. THOMISINÆ, 11-25.

Gen. *Diaa* Thor., 1-2.*D. dorsata* Fabr.

Nothing is known of this spider as a northern species except the record below, extracted from S.G.B.I. and localised in the V.C.H. by the Rev. O. Pickard Cambridge. Noted for North Wales, Dorset, Hants., Surrey, Essex, Oxford, Staffs., Lincs.

V.C. 63.—Bradford, R.H.M.

Gen. *Xysticus* C. L. Koch., 6-11.*X. cristatus* Clerck.

Common and widely distributed in the British Isles and on the Continent; in various situations on the ground, wandering amongst herbage or beneath stones. *Adult* ♂ May and June mainly, ♀ throughout the year. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61, 62, 63, 64.—Very widely diffused and recorded stations very numerous.

V.C. 65.—Croft, E.A.P.; Mickleton, Upper Teesdale; Semmerdale; Whorton; Aysgarth.

(To be continued).

'Science and Fisheries,' by H. G. Maurice, is the title of an interesting article in *Nature*, No. 2665.

'Diptera in South Shropshire,' by H. Bury, appears in *The Entomologist's Monthly Magazine*, No. 678.

Prof. W. Garstang contributes 'Robin's Water-music' to *Nature*, No. 2663: an innovation for *Nature*!

Among the interesting contents of *The Irish Naturalist*, Vol. 29, No. 11, is a paper on 'Some Irish Sawflies,' by W. F. Johnson.

The Museums Journal, Vol. XX., No. 4, has a paper on the Public Libraries Act of 1919, and its effect on the future policy of Museums, by E. E. Lowe.

According to *Nature*, No. 2668, Mr. C. S. Garnett is said to have discovered a new deposit of Fluorspar, a mile in extent and 30 feet thick, near Wirksworth.

In future a new *Journal of the Society of Antiquities* is to be published quarterly, by the Oxford University Press, and will take the place of the *Proceedings* of the Society.

We learn from the *Museums Journal* that Mr. Ashdown, formerly taxidermist to the Duke of Portland, has been appointed assistant caretaker at the Wilton Park Museum, Batley.

The Irish Naturalist for December contains a paper on the Pine Marten in Ireland, by R. F. Rutledge. He concludes that the species is far more common in that country than is generally supposed.

Well illustrated articles on 'The Black-headed Gull,' by A. Brook, 'Bees in the Garden,' by M. K. Bell, and 'A Roe Fawn,' by D. St. Ledger Gordon, appear in *The Animal World* for December.

'The Distribution of Wart Disease,' by H. V. Taylor, and 'The Rook: Its relation to the Farmer, Fruit Grower and Forester,' by W. E. Collinge, appear in *The Journal of the Ministry of Agriculture* for December.

W. G. Sheldon writes 'Notes on the Variation of *Peronea cristana*, Fab., with descriptions of Six New Forms, and the reasons for sinking the names at present in use of six others,' in *The Entomologist* for December.

The Scottish Naturalist for December has notes on the 'Walrus off the Shetland Isles,' 'The Breeding of the Brambling in Scotland,' 'The Breeding Habits of the Dotterel in Scotland,' and 'Nest of the Hawfinch in Aberdeenshire.'

The price of *The Scottish Naturalist* for 1921, and in future, will be doubled, namely 15/- per annum. *The Irish Naturalist*, also, will be doubled in price, namely a 1/- a part, and we certainly think the latter journal has done well to hold on to its pre-war figure so long.

The Olicanian (the Magazine of the Ilkley Grammar School), Vol. XXII., No. 1, contains a report of the work of the Natural History Society, and of its excursion to Malham; an article on 'Old Islandicus' (the Gyr-Falcon) and the first part of an interesting paper on Bird Migration, all by John L. Illingworth. We are delighted to find that the school possesses so enthusiastic a naturalist.

British Birds for December includes some notes on the Ruff, by E. L. Turner; 'The Nesting-Downs of the British Hawks,' by H. F. Witherby; 'An Early Record of the Great Buzzard in Kent,' by N. F. Ticehurst, and 'The Food of the Peregrine,' by J. F. Peters. There are several shorter notes, and we are glad to see that this journal is able to keep up its reputation for interesting short notes.

No. 58 of *The Geographical Teacher* is a remarkably fine number, and contains many valuable papers, mostly dealing with foreign geography. In notes on 'Geographie de Luxe,' Mr. O. J. Harding describes a day's outing by motor char-a-banc, the route taken being from Bradford to Leeds, Selby, Market Weighton, Driffeld, Garrowby Hill, Stamford Bridge, York, Wetherby, Harewood, and back to Bradford; not a bad day's outing.

NORTHERN NEWS.

Dr. E. H. Griffiths has been elected general treasurer of the British Association.

Dr. J. Allen Howe, Curator of the Museum of Practical Geology, has been appointed Assistant Director to the Geological Survey.

Dr. W. E. Collinge contributes a memoir on the 'Terrestrial Isopoda of Natal,' to Vol. IV., Pt. 2, of the *Annals of the Natal Museum*.

Part 9 of Witherby's 'Practical Handbook of British Birds,' (pp. 1-80, 4/6 net) has appeared, and deals with the Swift, Nightjar, and Owls. It is very well illustrated.

Our contributor, Mr. James Meikle Brown, writes on 'A new Termitophilous Collembolan from West Africa,' in the *Annals and Magazine of Natural History* for November.

Dr. Leigh Page has a paper on 'The Principle of General Relativity and Einstein's Theory of Gravitation,' in the *Transactions of the Connecticut Academy of Arts and Sciences*, Vol. XXIII., which he has kindly sent to us. We must admit we have not read it.

As Circular No. 4, the South-Eastern Union of Scientific Societies has issued an elaborately illustrated account of the work of the 'Mosquito Investigation Committee,' written by the Rev. T. W. Oswald-Hicks.

The Report of the Council of the Natural History Society of Northumberland, Durham, and Newcastle-on-Tyne, recently received, shows evidence of good progress in connexion with the Society's Museum at Newcastle, and there is a substantial list of additions.

We should like to congratulate the Geologists' Association on the publication of 'An Index to the Proceedings of the Geologists' Association, Volumes XXI. to XXX., 1909-1919, with a Chronological List of the longer Excursions,' by G. S. Sweeting, 44 pp., 5/-. It will be very useful to workers.

To mark the occasion of his presidency of the Iron and Steel Institute, 1920-1921, a presentation was made at Redcar, recently, to Dr. J. E. Stead, F.R.S., by his past and present pupils and students. The presentation took the form of a water-colour portrait of himself, painted by Miss Norah Fulcher, the well-known London artist.

The Council of the Geological Society has this year made the following awards:—Wollaston Medal (in duplicate).—Dr. John Horne and Dr. B. N. Peach. Murchison Medal.—Mr. E. S. Cobbold. Lyell Medal.—Dr. E. de Margerie. Bigsby Medal.—Dr. L. L. Fermor. Wollaston Fund.—Dr. T. O. Bosworth. Murchison Fund.—Dr. Albert Gilligan. Lyell Fund.—Professor H. L. Hawkins, and Mr. C. E. N. Bromehead.

We are pleased to state that Messrs. W. H. Pearsall, M.Sc., F.L.S., 1 Woodsley Terrace, Clarendon Road, Leeds, and F. A. Mason, F.R.M.S., 29 Frankland Terrace, Leopold Street, Leeds, have agreed to act as Hon. Secretaries to the Yorkshire Naturalists' Union. In this way the headquarters of the Union revert to Leeds, after having been diverted to Hull and later to Huddersfield. We feel quite sure that under the guidance of the new secretaries the Union will have a prosperous career. Letters may be addressed to the Secretaries, Y.N.U., at The University, Leeds.

We regret to see the announcement of the death of Sir Lazarus Fletcher, who, in 1909, succeeded Sir Ray Lankester as Director of the National History Departments of the British Museum. He was born at Salford in 1854. He accepted an assistantship in the Department of Mineralogy at the British Museum, succeeding to the Keepership in 1880, when he was only 26 years old. He was elected to the Royal Society in 1889, was awarded the Wollaston Medal of the Geological Society in 1912, and received numerous honorary degrees and memberships from universities and societies at home and abroad. His work during many years for the Mineralogical Society, of which he was president from 1885 to 1888, and thereafter secretary till 1909, was not the least of his unselfish services to science.

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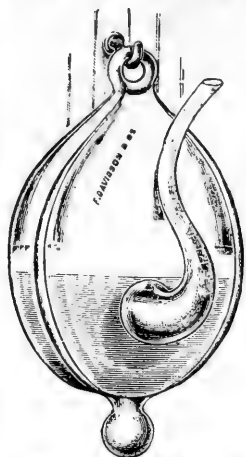
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 Feb. 1st, 1921.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

COMMITTEE OF SUGGESTIONS.

A field meeting for **Peat Investigation**, under the leadership of Mr. J. HOLMES, will be held at Crosshills on **March 12th**, leaving the station, on the arrival of the 1-42 p.m. train, by the motor bus.

As flint implements and buried trees are found at the base of the peat on the moors, the excursion should prove instructive.

CHRIS. A. CHEETHAM,
Convenor.

COMMITTEE OF SUGGESTIONS.

All Entomologists and any others interested are invited to a meeting in the **Zoological Lecture Room, Leeds University**, on **March 17th**, at **7-30 p.m.**

Mr. H. H. WALLIS, M.A., will open a discussion on the need for a study of Insect Communities on the lines suggested in *The Naturalist* for March.

Mr. T. H. TAYLOR, M.Sc., will read a paper suggesting some insects whose life-history needs investigation by intensive recording methods.

CHRIS. A. CHEETHAM,
Convenor.

BOOKS WANTED.

Geol. Soc., London, Trans. 2nd ser., Vol. VI., and Pts. 1-3 of Vol. VII (or Vol.).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1894.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Marine Biological Com. 1st Report.
Liverpool Geol. Association Proc. Parts 1, 3, 16.
Liverpool Nat. Journ. Parts 1, 3, and 20.
Manchester Geol. Soc. Trans. Vols. XV., XVI., XXIII.
Marine Biological Assoc. Journal. Vol. I., Pts. 2 and 3.
Naturalists' Guide (Huddersfield). Parts 1-38.
Naturalists' Record. Set.
Newbury District Field Club Transactions. Vols. III. and on.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Peterborough Natural History Society. Reports 1-8, 11-12, 14-25.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Quekett Club Journ. 1st Series, No. 25.
Royal Cornwall Geological Society Trans. Vol. V. to date (or parts).
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891.
Simpson's Guide to Whitby. 1st ed., 1862.
Smith's New Geological Atlas of England and Wales. 1819-21.
Stirling Natural History Society. Vols. 2, 8, 12, 15, 16, 20.
Sussex and Hants. Naturalist. 17 parts.
Sussex Arch. Collections. II.-III.
Tweddell's Bards and Authors of Cleveland. Parts 9-12.
Union Jack Naturalist. Any.
Vale of Derwent Nat. Field Club. Old Series, Vols. I. and III.
Wakefield Lit. and Phil. Soc. Reports. Set.
Woolhope Club Trans. 1871-3, 1877-80.
Yorks. Nat. Club Proc. (York). Set. 1867-70.
Yorks. Nat. Union Trans. Part 1.
Zoologist, February, 1905.

Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

MR. H. B. BOOTH, F.Z.S., M.B.O.U.

Probably for the first time in its history the Yorkshire Naturalists' Union has lost its President by death; the recent loss of our old friend, H. H. Corbett, occurring before he was able to attend a single meeting as President. In his place, by the unanimous vote of the Executive Committee, Mr. H. B. Booth has been elected. Mr. Booth is one of our most hard working members, and has taken a prominent part in the work of the Union and its various Committees for many years past. Readers of *The Naturalist* are also familiar with his work among the Birds and Mammals of our county. In Bradford, Mr. Booth has taken a prominent part in the scientific welfare of that city, having occupied many important positions, including that of President, in the Bradford Naturalists' Society. Mr. Booth is a strong advocate for the proper record of Natural History observations, and takes infinite pains to satisfy himself that an identification made is reliable, before committing it to print. This is a very desirable trait in the character of a Field Naturalist. We feel sure the Union will have a pleasant and prosperous time during his presidency.

RETIREMENT OF PROF. KENDALL.

In view of many services to *The Naturalist* rendered by Prof. Kendall, our readers will be interested in the following copy of a circular which has been issued:—'In June next, Professor Percy Fry Kendall, M.Sc., will retire from the Chair of Geology at the Leeds University. At a representative meeting held in the Leeds Philosophical Hall, recently, it was felt that the occasion would be appropriately marked by the presentation to him of some form of testimonial. A Committee was appointed to make the necessary arrangements. Professor Kendall, possessing a brilliantly original mind, has distinguished himself during the thirty years that he has worked in Yorkshire, by opening up new and fascinating fields of inquiry in geological science, and by fertile resource in pursuing his investigations. It is only necessary to mention specifically his splendid work in Glacial Geology and the importance, on their economic as well as their scientific sides, of his contributions to the geology of Coal and Coalfields.

PROF. KENDALL AS TEACHER.

As a teacher the stimulus of his personality has impressed itself deeply upon successive generations of students, and has extended far beyond the walls of the University, for he has been ever ready to give his services as lecturer and leader to local societies in Yorkshire and the North of England generally, and his addresses, enlightened by humour and

imagination, have had great influence in encouraging workers and popularising geological studies. The members of the Committee feel confident that a large number of persons and societies will desire to join in this tribute of appreciation and regard. Cheques may be crossed and made payable to the Hon. Treasurer, J. E. Bedford, Esq., F.G.S., and should be sent to him at Arncliffe, Shire Oak Road, Headingley, Leeds. It is intended that the presentation to Professor Kendall shall include an address with the names of the subscribers, but the amounts of contributions will be regarded as confidential by the Committee.'

PURE 'BLUE JOHN.'

We learn from *The Quarry* that the recently discovered 'Troke Cliffe' Mine is the only one in the world producing almost perfect Blue John Fluorspar. Apart from the ordinary commercial quality so largely used by steel works, the really choice specimens are used for turning and ornamental purposes. Thus the material is a very valuable one. An analysis of the product from the mine proved the same to be practically pure; it contains 97.92 per cent. of calcium fluoride and 0.6 per cent. of calcium carbonate. The outside workings of the mine are in quarry form, and there is a most unusual face of solid Blue John variety of fluorspar. The increasing output from this mine will do much to relieve the present shortage of this material, and progress within the last three months has been so rapid that a transport tramway has had to be laid down. Within a short time there will be a large number of men engaged on a workable face of some 30 to 40 feet. Developments are being planned by the owners to increase the output considerably, and only the highest grade of Blue John will be placed on the market.

BUREAU OF BIO-TECHNOLOGY.

The Bureau of Bio-Technology, Queen Square, Leeds, issues a useful Bulletin, parts 1 and 2 of which are before us. Among the papers are 'Microscopy and Biology in Industry,' 'System in the Nomenclature of the Bacteria,' 'The Destruction of Stored Grain by *Trogoderma khapra* Arrow, a new pest in Great Britain,' all by F. A. Mason; 'An Investigation of the Causes of "Run" Pelts in the Sweating Process,' by P. Hampshire. There are also interesting 'Notes from the Laboratories.'

A NEW ANTIQUARIAN JOURNAL.

A valuable new magazine made its appearance in *The Antiquaries' Journal*, being the journal of the Society of Antiquaries of London. It is quarterly, issued at the Oxford University Press, at 5s., and takes the place of the Society's Annual 'Proceedings,' which therefore cease. The journal is

not necessarily confined to papers discussed by the Society, and in addition contains an excellent summary of current antiquarian literature. Among the contents of Part I are well illustrated Reports on the Excavations at Stonehenge, by Lt.-Col. Hawley; 'The Discovery of [Roman] Silver at Traprain Law,' by A. O. Curle; and 'An Imperfect Irish Shrine,' by E. C. R. Armstrong.

THE SELBORNE MAGAZINE.

The Selborne Magazine, No. 344, covers the period Aug. 1920 to Jan. 1921. The editor considers that probably short notes are more interesting than long articles, and consequently gives short notes. He is no doubt correct in this, but the scientific value of articles should be considered as well. Some of the most useful articles appearing in *The Naturalist*, for example, could hardly be called 'interesting.' Mr. Mark Webb contradicts a statement made by E. K. Robinson to the effect that 'Gilbert White was not, as often represented, a retiring and unambitious student of nature; on the contrary his letters showed by internal evidence that they were written for publication.' Evidently a case of 'set an unambitious student to catch an unambitious student.'

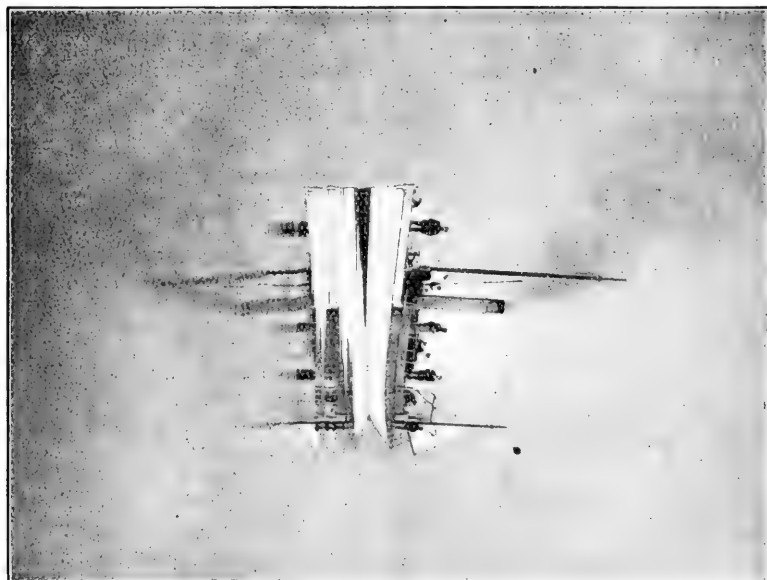
WESTPHALIAN MEASURES OF YORKSHIRE.

Following the paper on the Ecology of Plants from the Westphalian Series of East Glamorgan, at a recent meeting of the Geological Society of London, Prof. P. F. Kendall stated that: 'In the Westphalian measures of Yorkshire the roofs of many seams—for example, the Silkstone, Middleton Main, Haigh Moor, and Parkgate—contained prostrate stems of *Sigillaria* and "pot-holes"; the casts of hollow tree-stumps were also of frequent occurrence in similar positions. He had never observed Lepidodendroid trunks along with them: on the other hand, the roof of the Barnsley Bed was renowned as a source of fine fern-like plants. With regard to the habitat of the different types, whereas Lycopods commonly, and Calamites more rarely, were to be found rooted in the position of growth, he could not recall a single instance in which unequivocal evidence of fern-like plants in the attitude of growth had come under his observation. The speaker had been enabled, by the generosity of the owners of collieries in Yorkshire, to obtain a unique suite of thin sections, exhibiting the whole thickness from floor to roof of the Barnsley Bed, from six pits, and he had hopes of ultimately covering the entire field from Leeds to Nottingham.'

LIVERPOOL BIOLOGISTS.

We have recently received Volume XXXIV. of *The Proceedings, etc., of the Liverpool Biological Society* (184 pp., price 10/6) which includes more than might be assumed from

the list of contents. The volume contains H. R. Rathbone's Presidential Address on 'Wheat and its Pests'; Professor Herdman contributes the Committee's Thirty-third Annual Report; S. T. Burfield writes on 'The Hand Skeleton of some Cetacean Foetuses.' Then follows a series of reports, etc., including 'Food of Port Erin Mackerel in 1919' and 'Mid-winter Invasion of *Noctiluca* and *Ctenophora*,' by A. Scott; 'The Dietetic Values of Herrings and other Fishes,' and 'Certain Parasites, Diseased and Abnormal Conditions of Fishes,' by Jas. Johnstone; 'A Contribution to the Ecology

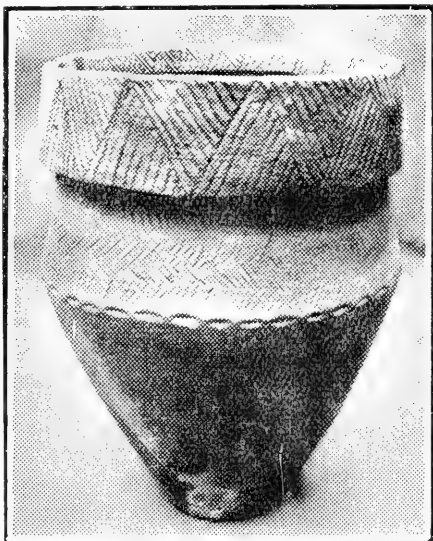


A "Ladybird."

of Some Cockle Beds,' and 'Notes on the Shell of *Cardium edule*,' by C. L. Walton; 'On Periodicity in the Abundance of Plaice off the Mersey Estuary' and 'The Results of Drift Bottle Experiments,' by R. J. Daniels; and 'An Intensive Study of the Marine Plankton around the south end of the Isle of Man,' by W. A. Herdman, A. Scott and H. Mabel Lewis. There are a number of illustrations, including an interesting view of the Committee's Steam Yacht 'Ladybird.' Partly in order to save space and partly to demonstrate the beauties of this 'painted ship on a painted ocean,' we have put this block, which has kindly been lent us to, sideways, and its real beauty can be ascertained by looking at it from the left-hand side of the page.

SHEFFIELD ANTIQUARIES.

The Transactions of the Hunter Archæological Society (Vol. II., No. 1) contain many valuable papers bearing upon the antiquities of the Sheffield area. Two of the papers particularly appeal to us; one (Bone and Flint Implements from Bradfield, by A. L. Armstrong) has already appeared in *The Naturalist*. The other, by the same author, describes a Bronze-age Cinerary Urn from Dronfield Woodhouse. This, with other specimens from the same locality, is now in the Sheffield Museum, where, judging from the paper, obstacles seem to be put in the way of the urns being even seen, much less examined! The urn forming the subject of the paper was broken, but has been repaired. Mr. Armstrong says of it: 'The find is of exceptional interest and importance, because the urn is superior to any specimen of its type in the British Museum, the Bateman Collection in the Weston Park Museum, the Mortimer Collection at Hull, or to any of the type specimens illustrated by Abercromby in *Bronze Age Pottery*, published in 1912. There is good reason for considering it the finest example of its class recorded in Britain.' We are a little puzzled to know in what way it is superior to any other, and what the 'good reason' is for considering it the finest example in Britain? Without going further than the Mortimer Collection (and we know that Collection), we consider that it contains a specimen 'superior' to the Dronfield Woodhouse example, the illustration of which we are kindly permitted to reproduce.



CLEVELAND NATURALISTS.

The Proceedings of the Cleveland Naturalists' Field Club, 1914-1919 (Vol. III., Part 3, pp. 147-186, 2/6 net), have been published, and bring the record of the work of that Society up to date. J. S. Calvert gives a good general

account of 'Cleveland in English History'; Mr. T. A. Loft-house writes 'Bird Notes in the Albert Park, Middlesbrough,' and 'Table of Summer Migrants observed in Middlesbrough district from 1882 to 1907'; and an Obituary Notice of the late Rev. J. C. Fowler. ; M. Lawson Thompson gives the result of five years' work among the 'Coleoptera observed in Cleveland.' What is described as a 'Summary of Secretaries' Reports, 1914-1919,' is a list of the meetings and excursions, which occupies two pages. The balance sheet shows that the Society is favourably situated, financially.

NEWSPAPER NATURAL HISTORY.

For some time we have been pained, and sometimes



amused, at the awful piffle appearing in some of our daily papers under the guise of 'Nature Notes,' and even people holding responsible positions in public institutions have poured out their drivel—not always to the credit of the institutions! But we think 'the limit' has been reached in the illustration which we reproduce herewith, as it appeared in a paper called *The Daily Mail*, dated February 16th. We have put it precisely as it appears in the newspaper—to show the total disregard of the law of gravity which, the 'tasty

piece of fat hung on a string' has. The words underneath this remarkable illustration are—

'A NATURE NOTE.—The bat is not often seen in the daytime, but a tasty piece of fat hung on a string in the garden will lure him from his diurnal retreat.'

To mistake a bird for a mammal is bad enough, but to caricature our friend the Titmouse in this way, and then to call it a 'Nature Note,' is really too much.

YORKSHIRE ARCHÆOLOGISTS.

Part 100 of *The Yorkshire Archæological Journal* is principally occupied by a careful architectural description of St. Mary's Church, Beverley, by John Bilson. There is a short note on 'The British Remains of Hinderwell Beacon,' accompanied by illustrations of stones, many of which are

obviously imperfect, and scratched by ploughs or other similar agency. The authors say, 'Possibly, some day they will be found to furnish a pre-Roman link with Scandinavia.' Possibly not. No. 101 of the same journal, issued simultaneously, is occupied by an elaborate and scholarly report on 'Excavations at Slack, 1913-1915,' by P. W. Dodd and A. W. Woodward. It is illustrated by a plan, views of excavations, relics, etc., on 27 plates.

THE DINOSAUR.*

Behold the mighty Dinosaur,
Famous in prehistoric lore,
Not only for his weight and strength,
But for his intellectual length.
You will observe by these remains
The creature had two sets of brains—
One in his head (the usual place),
The other at his spinal base.
Thus he could reason *a priori*
As well as *a posteriori*.
No problem bothered him a bit :
He made both head and tail of it.
So wise he was, so wise and solemn,
Each thought filled just a spinal column.
If one brain found the pressure strong,
It passed a few ideas along :
If something slipped his forward mind,
'Twas rescued by the one behind :
And if in error he was caught,
He had a saving afterthought.
As he thought twice before he spoke,
He had no judgments to revoke :
For he could think without congestion,
Upon both sides of every question.
Oh, gaze upon this model beast,
Defunct ten million years at least.

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Starlings with young, in January, at Harrogate.—

This morning, January 23rd, a pair of Starlings is carrying food to its young. Starlings had been busy about their nesting hole for some time, but I had no idea they were really busy with family matters. The winter has been extraordinarily mild, and roses in abundance have been blooming in the open, the recent high winds have, however, played havoc with the flowers. It was strange to see the bushes with plenty of blooms, but no leaves. Some gardens are now full of Prim-roses, Polyanths, etc. If the present mild weather continues, many early nests will be found.—R. FORTUNE.

* B. L. Taylor in *The Chicago Tribune*.

GEOLOGICAL NOTES AND NEWS.

Mr. W. A. Richardson has an illustrated paper on 'The fibrous Gypsum of Nottinghamshire,' and another on 'A new Model rotating-stage petrological microscope,' in *The Mineralogical Magazine* for December.

In referring to the work of Yorkshire geologists at the Annual Meeting of the Yorkshire Naturalists' Union, Prof. J. E. Marr stated that the most valuable geological work published during the year was by a predecessor of his in the chair, on 'William Smith: his Maps and Memoirs.'

The Quarterly Journal of the Geological Society, No. 301, contains 'The Anniversary Address of the President, Mr. G. W. Lamplugh, F.R.S.,' on 'Some Features of the Pleistocene Glaciation of England,' and Mr. S. S. Buckman's contribution on Jurassic Chronology, in which he compares the distribution of Lias ammonites, etc., in the West of England with that in Yorkshire and other parts.

Our American friends are very thorough in the way of their publications, as shown by Bulletin No. 109 of the Smithsonian Institution, recently published. This is entitled 'Contributions to a History of American State Geological and Natural History Surveys, edited and compiled by G. P. Merrill,' contains about 600 pages, and is illustrated by an enormous number of portraits of well-known American Geologists.

No. 302 of *The Quarterly Journal of the Geological Society* contains three papers of particular interest to northern naturalists. The first two, by Mrs. E. M. Reid (Two Pre-glacial Floras from Castle Eden, County Durham, and A Comparative Review of Pliocene Floras, based on the Study of Fossil Seeds), will appeal to those naturalists investigating the peat deposits. The third paper is by Dr. F. J. North on 'Syringothyris Winchel, and certain Carboniferous Brachiopoda referred to *Spiriferina* D'Orbigny.'

Among the contents of the recent issues of *The Geological Magazine* likely to interest our readers we notice 'The Origin of Flint,' by R. M. Brydone; 'The Distribution of British Carboniferous Nautiloids,' by the late Wheelton Hind; 'William Smith: his maps and Memoirs' [review of], by Prof. J. E. Marr; 'Obituary Notice, Wheelton Hind, with list of Memoirs'; 'The Quartzose Conglomerates at Caldron Low,' by J. W. Jackson and J. K. Charlesworth; 'The Iron Ore Supplies of the World,' by F. H. Hatch; 'A Theory of the Marginal Drift,' by W. B. Wright; and 'Notes on the Genus *Sphaerocorpe*,' by W. B. R. King, the last being based on an exceptionally complete specimen from the Ashgillian Beds of Norber Brow, Yorkshire.

The annual meeting of the Yorkshire Geological Society was held at Leeds on December 1st, and the attendance and the nature of the papers read were reminiscent of the days before the war. The annual report showed that the membership was about 145. The treasurer's statement indicated a balance in hand of £100. The Secretary, Mr. H. E. Wroot, outlined the work of the Society during the past year, and indicated ways in which the work might be done in the future. As illustrating the fact that notwithstanding all that has been accomplished in the county by some of the greatest authorities on British Geology, there is still much to do, the following papers were read and discussed:—By Mr. J. W. Stather, 'An extraordinary section in the Oolites and Glacials at South Cave'; By Mr. W. S. Bisat, 'Coralline clays and other beds near North Ferriby'; By T. Sheppard, 'New evidence as to the sites of the lost towns of the Humber'; By Prof. Kendall, 'Speculations on the history of the Yorkshire Rivers'; By Mr. Wilfred Barker, 'Palaeobotany of the Barnsley Bed.' Perhaps as a sign of the times, a resolution was passed making it clear that women were eligible for election as members.

TWO EAST YORKSHIRE BRONZE AXES.

97

T. SHEPPARD, M.Sc., F.G.S.

THROUGH the kindness of Col. J. B. Stracey-Clitherow, the Hull Museum has become the possessor of two important



Bronze-Age relics, found in the Hotham district of East Yorkshire. The first is a palstave, which was 'found by Mr. Stather while ploughing at Hotham in 1884.' The specimen is a well-made example, with a very prominent medial rib, which is made even more prominent near the socket by distinct depressions having been formed on each side. There is a loop for attachment, and the recesses for the split shaft

of the handle are deep. It much resembles some of the axes discovered at Hotham in 1867, which were formerly in the possession of Canon Greenwell, were sold by him to the late Pierpont Morgan, and are now in the British Museum. They were illustrated by the present writer in the *Transactions of the Hull Scientific and Field Naturalists' Club* for 1900, and I think it can be taken that the axe head, now figured, is part of the founder's hoard therein described, although it was discovered many years subsequently. This supposition is borne out by the fact that the axe is partly broken through in the centre, the lower half being almost exactly similar to a broken half in the Hotham hoard, in addition to which the top part of the axe is hammered down. The specimen measures $5\frac{5}{8}$ in. in length, $2\frac{3}{4}$ in. in greatest width, the cutting edge is $3\frac{1}{8}$ in. long, and across the wings it is $1\frac{1}{8}$ in. wide. The weight is $14\frac{1}{2}$ ozs.

The other example is a socketed axe, of a distinctly late and plain type. The socket is slightly squared on the outside, and almost circular on the inside. There are traces of a simple collar, half-an-inch from the top, and the axe is devoid of the usual three raised ribs on each side, or of any other form of decoration. In general type it is similar to those from the Scarborough hoard, described in *The Naturalist* for 1918, page 280. It is $3\frac{3}{8}$ in. in length, $1\frac{3}{4}$ in. greatest width; the cutting edge, which is not hammered out very much, is $1\frac{7}{8}$ in.; across the socket, the outside measurement is $1\frac{3}{8}$ in., the inside $1\frac{1}{8}$ in. It weighs 7 ozs. The axe, however, possesses a feature which is altogether different from any other socketed example, either in the Hull or Driffield Collections, or in the Doncaster, Whitby, Scunthorpe, or other Museums, which I have examined and described. That difference is in the line made by the junction of the valves forming the mould, which instead of being straight, is distinctly wavy, evidently due to the fact that the halves of the moulds fitted together in a wavy edge, instead of a straight one. This is particularly noticeable on the opposite side to the loop or handle. The specimen was found at Walling Fen, near Howden, in 1883.

In the British Museum Guide to the Antiquities of the Bronze Age, Second Edition, p. 113, is figured a 'Bronze mould for palstaves,' the valves of which shew a similarly serrated edge, and any palstaves cast in this mould might be expected to have a similar feature in this respect, to that of the Walling Fen socketed axe. Mr. Reginald Smith, F.S.A., of the British Museum, however, informs us that while the outside of this mould has the mortise and tenon arrangement, the inside is straight and the lines on the axes cast therein are normal. Mr. Smith also informs us that he knows of no socketed axe with a wavy line on the edge, like ours.

INSECT ASSOCIATIONS.

H. H. WALLIS, M.A.

WITHIN the last few decades, considerable advance has been made in the study of ecology. The relations of structure and distribution of plants to the physical factors of their environment have been studied, and we are well acquainted with the term 'plant association.' This seems but the starting point of a line of investigation which, though involving detailed research and the compilation of masses of statistics, will ultimately lead to a much better understanding of the habits, distribution, structural metamorphosis and interdependence of animals.

The factors which determine the structure and local distribution of plants are soil, temperature, altitude, water supply, prevailing winds, etc. Upon these depend the association of plants. Regional distribution and geographical distribution seem to be similarly dependent, with the introduction of further factors, such as barriers and agencies of distribution.

While much work has been done on the regional distribution of insects in the way of county lists and the records of individual collectors, more remains to be done in the study of the insect from the ecological standpoint. Why is *Papilio machaon* restricted to the fen district in England? On the continent it occurs commonly in woods, on mountain slopes up to an elevation of 5000 feet, and less abundantly at even higher altitudes. In the past it was of much wider distribution in England: Stephens gives localities near London in 1827. The food plant it most affects, *Peucedanum palustre*, is certainly uncommon, except in the marshy districts of Eastern England, from Suffolk to Yorkshire; but it will also eat *Angelica sylvestris*, *Fœniculum vulgare* and *Daucus carota*, which are abundant in many localities. The Milk Parsley and Angelica are marsh-loving plants; the Swallow Tail butterfly is, in England at all events, a marsh-loving insect, and there our knowledge ends.

No doubt there are many cases in which the non-appearance of the insect is determined by the absence of the food plant of the larva, or, in the case of parasites, by the absence of the host, but in many instances other factors will determine the distribution of the insect, especially if of catholic tastes in the matter of food. *Carabus glabratus* seldom occurs below the 500 feet level. Is this insect a survival of a glacial period? As the ice retreated from the valleys, did this beetle forsake the warm lower levels for the cooler hills? What factor determines the relegation of *Dytiscus punctulatus* to the mountain tarns of the Western Highlands? Why does

Panagoeus quadripustulatus prefer a chalk soil and *Cicindela campestris* a gravel? Many such questions as these will occur to all entomologists. The answers to most are still to seek. Much more precise information as to locality of capture is needed. If collectors could be persuaded to keep accurate data of the ecological factors of the immediate neighbourhood of the capture, and these details could be collated and filed by a central authority, much useful information would soon be available from which inference could be drawn. The field for research is here, there and everywhere; a meadow, an oak wood on a dry soil, another on a damp, and so on.

We are investigating the peat. What is the 'insect-association' of an acre of cotton-grass? If each of our Yorkshire entomologists would work at some small natural region in his immediate neighbourhood for one year the collective result would be of immense value. If the work were carried on for ten or twenty years, the science of the ecology of insects would be firmly established.

1.—*Methods of Research.*

A.—It is suggested that each year the members of the Yorkshire Naturalists' Union be asked to record, with *exact details* as to locality, plant association in neighbourhood of capture or observation, weather, date, time of day, and other insects associated with, the occurrence of half-a-dozen well-known insects.

B.—That certain small but well-defined natural regions be systematically worked for a year by one or more capable entomologists, so that the insect fauna of the region can be enumerated. One or more of these regions should be cotton grass associations, as the knowledge obtained would be valuable for the peat research.

The details required can be set out in *The Naturalist*, and the records sent in annually to the central authority, or members interested could apply for printed or other uniform forms, on which to make their records. This method would be more expensive but would simplify filing.

2.—*Methods of dealing with Records.*

Record of certain species.—Outline maps of the county should be printed on transparent paper. These can be placed over county maps shewing separately, geology, rainfall, elevation, vegetation, distribution of supposed food plants, etc. On the thin outline map the occurrence of the insect can be marked with red dots. Factors affecting distribution might be discovered in this way. (One must keep in mind that the obvious is not always the correct.)

Outline county maps might be supplied to the recorders

of the various orders of insects, on which the occurrence of the insect can be marked with a red dot. If the maps are sufficiently small they can be index-filed, and a separate card kept for each species. At any rate, this might be done for Coleoptera, Diptera, Lepidoptera and Hymenoptera aculeata.

The Botanical Survey Committee might be asked to assist in the matter of preparing Botanical maps.

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The Yorkshire Post for January 28th records a Little Auk at Silsden. We see the Selborne Society is to meet in Leicester Square. For this excursion no leader is appointed.

Mr. J. F. Musham informs us that early in February a living wall-gecko reached Selby in a case of oranges.

The Entomological Society of London has now its own premises in Queen's Gate, near the Natural History Museum, London.

'The Appendages, Anatomy and Relationships of Trilobites,' by P. E. Raymond, is the title of an elaborately illustrated memoir issued by the Connecticut Academy of Arts and Sciences.

Mr. Charles Upton, a local naturalist, has been appointed Curator to the Gloucester Museum, and Mr. H. W. Ricketts, of the Sunderland Museum, has been appointed deputy-curator at West Hartlepool.

We are glad to learn that in the future the parts of *The New Phytologist* will be numbered one to five, in each year, and the double-numbers and the consequent necessity for complicated references will be dispensed with.

In a Guide to the Collection of Irish Antiquities recently issued, Mr. E. C. R. Armstrong gives a catalogue of the Irish Gold Ornaments in the Collection of the Royal Irish Academy. There are nearly 500 illustrations, and the Guide is sold at the remarkably low price of 2s.

The first annual silver medal awarded by the Yorkshire Numismatic Society at its recent annual meeting bears the inscription: 'First Annual Medal presented to Mr. T. Sheppard, M.Sc., F.G.S., F.S.A., Scot., by the Yorkshire Numismatic Society for valuable Services rendered and for his Researches in Yorkshire Numismatics.'

We learn from the press that M. L'Abbe Breull, the great student of the 'pre-history' of man, is going to lecture in London on his discoveries. It was M. L'Abbe who found signs of prehistoric man at Bacon Hole, in Glamorganshire, some years ago. He found paint marks of vivid red on a cave side. He said it was the work of man 40,000 years ago, but other folk testified that one Johnny Bale, a local fisherman, made the marks when cleaning his paint brushes.

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MIGRATORY MOVEMENTS OF BIRDS NEAR HULL.

E. W. WADE, M.B.O.U.

IN the neighbourhood of Hull, which is in the track of the Autumn and Spring Migrations of birds, the problems connected with these movements must always engage the attention of

ornithologists. The question as to what faculty enables them to find their way on migration is still a disputed point. Do they rely upon their marvellous powers of sight, or is the sense of direction the guiding motive?

Col. R. Meinertzhagen's researches into the question of the altitude at which birds fly on migration, assisted by all available observations made from aeroplanes, lead him to the conclusion that they do not often exceed 3000 feet above the earth's surface in clear weather, *i.e.*, at a height where landmarks would be visible; but, on the other hand, in thick weather they descend to much lower altitudes, which points to the necessity of their keeping the earth in view in order to maintain direction. On the other hand, reports from lighthouses and vessels at sea show that there is much migration, especially among smaller birds, at a very low altitude, or just above sea level, when, as they could have no chance of seeing their objective, the only guide would be a sense of direction. So far as the evidence available in this district goes, it would seem that sight is the faculty upon which birds rely. In clear weather we distinguish migrant birds by their cries as they pass overhead, but in foggy weather they seem altogether to lose their way.

I was kept awake one foggy November night in 1901 or 1902 by the incessant cries of waders flying about over the City of Hull. Lying awake with my window open, they seemed to be on a level with the housetops, and in such numbers that their cries entirely precluded the possibility of sleep until the early hours of morning. Apparently no sense of direction prevented these birds from being drawn to the City lights, which, on a clear night, they would have left far below. If such a sense guides the birds, why should the blanket of fog, which shut off the earth from view, entirely destroy its operation.

For the last eleven years I have lived near the Humber, and watched the Pink-footed Geese, which arrive about 22nd September and leave us about mid January, in their daily flight from the high wolds, where they feed during the day, spending the night on the Humber. At or near daybreak the flight to the feeding-ground commences, the districts most favoured being the neighbourhood of Newbald and Arras, about 8 or 10 miles away in a direct line, these flights being proclaimed by loud and incessant cries. The routine continues daily throughout the four months or so which they spend with us, the resting-ground for the night being the Humber, roughly, from Trent Ness to Hessle, so far as my district is concerned. One would suppose that the birds would become fairly familiar with the direction and route. In clear weather they make a bee line for the feeding ground,

but on a foggy morning, or when the ground haze is not sufficient to make them invisible from below, they fly round the district close to the Humber, *i.e.*, at the very commencement of the morning journey, sometimes for as much as three hours, apparently quite unable to decide what direction to take. This happened several times last December, after the same route had been followed every day for three months. Mr. F. Boyes can remember one occasion when, on their return journey, they even descended in the streets of Beverley on a foggy night, apparently quite lost, tired of flying round in the fog, and attracted by the lights.

Arguing from lesser things to greater, how do these birds, distinguished by their strong powers of flight, as well as intelligence, find their way from Spitzbergen to our shores except by sight, if a fog or even a ground haze is sufficient to put them off a flight of only 10 miles over familiar ground?

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Waxwings in Yorkshire.—Reports from three correspondents in widely distant areas—one from each of our three Ridings—have reached me recently of the occurrence of Waxwings in their neighbourhoods. It appears as though we were going to have a 'Waxwing year,' and members of the Yorkshire Naturalists' Union and the readers of *The Naturalist* should keep a sharp look-out for these beautiful Arctic visitors, and record observations. These birds feed particularly on winter berries.—H. B. BOOTH, Ben Rhydding, February 22nd, 1921.

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In Memoriam.

J. W. CARTER.

By the lamented death of John William Carter, at the age of 68, which took place at Bradford on December 15th last, the Yorkshire Naturalists' Union lost one of its oldest members, and the Bradford Natural History Society the last of its founders. He was present at the Annual Meeting of the Union at Bradford on December 4th. He was then apparently as genial as ever, though it was obvious that he was suffering, and it was known to a few that an operation was imminent. On the following Tuesday he underwent an operation, the shock of which eventually proved fatal.

Mr. Carter was born at Bradley, near Huddersfield, and at an early age showed a strong inclination for the study of Natural History, and he became associated with a circle of competent field naturalists for which, even in those days, Huddersfield was reputed.

About 1874 the Carters removed to Bradford, and in 1875

J. W. Carter, with his father and John Firth, who had also immigrated from Huddersfield district, and one or two others, founded the Bradford Natural History Society, which was subsequently amalgamated with the Bradford Microscopical Society. John Carter, the father, was elected as President, and the son as Secretary. Since the establishment of the Society, J. W. Carter was one of its most zealous members, was the dominating spirit throughout its existence, and he rarely missed being present at the meetings.

He was prospective President of the Society, an office he has filled with distinction in previous years.



Mr. Carter's chief interest throughout his career was in the various branches of Entomology, Macro-Lepidoptera being his first study. He quickly acquired an expert knowledge, and was a keen worker in the field. As early as 1877 he was the means of adding *Stilbia anomala*, found near Bradford, to the county list, and he supplied much information relating to Lepidoptera, in Vice Counties 63 and 64, to Mr. G. T. Porritt when he was compiling the list of Yorkshire Lepidoptera, published in the Transactions of the Yorkshire Naturalists' Union. After becoming proficient in Lepidoptera, Carter turned his attention to Coleoptera, and was a prominent member of the Yorkshire Coleoptera Committee. He added many species to the County List, including *Anchomenus ver-*

sutus, new to the north of England, and *Lesteva luctuosa*, new to England (only previously recorded from Eigg, in Scotland). *The Naturalist* since 1877 contains numerous articles from his pen, on our Yorkshire Beetles, and the Bradford Society is indebted to him for keeping their local list up to date. Orthoptera and Neuroptera (Odonata) in due course received his attention. His record of insects in these orders in Upper Airedale will bear ample testimony to his indefatigable industry, and to his conscientious regard for verified facts.

In order to become acquainted with the neglected or lesser known orders of insects, Mr. Carter in his later years concentrated his attention chiefly on one particular order or group during a season. During the past summer he was specially interested in social species of Hymenoptera, and he busied

himself with the preparation of a series which he exhibited at Bradford in December last on the occasion of the Annual Meeting of the Union.

But he was essentially an all round naturalist, and he was justly proud of his wide knowledge. He frequently deplored over-specialization at the expense of general knowledge. At an early stage of his career he attended botanical classes with the late William West, with whom he was much associated. Later he attended botanical classes conducted by Mr. West. His knowledge of British flowering plants was considerable.

Mollusca also received his attention, and, in conjunction with H. T. Soppitt, he published a list of the 'Land and Freshwater Mollusca of Upper Airedale' in *The Naturalist*, 1888, p. 99-102. To this journal he has been a contributor since 1877. The London Entomological journals occasionally received contributions from him. Until the publications ceased, the *Young Naturalist* and the *Bradford Scientific Journal* were indebted to him for frequent contributions. Mr. Carter always urged that the study of Natural History should be made popular, as he was of the opinion that it was the means of securing recruits. For twenty years he conducted a Natural History column in the *Bradford Weekly Telegraph*, part of the time in co-operation with his friend, H. T. Soppitt. A diary of Natural History observations was reprinted from this journal in 1881.

He was rarely absent from the meetings of the Entomological Section of the Yorkshire Naturalists' Union. He served as President of the Section, and also served on all its Committees. His exhibitions were numerous and important.

'It was Mr. Carter who originated the work of recording Natural History observations in Upper Airedale, which has resulted in an unbroken yearly list of additions to the Flora and Fauna being preserved by the Bradford Natural History and Microscopical Society.'

In 1900 he was elected a Fellow of the Entomological Society of London, and he was a corresponding member of the Lancashire and Cheshire Entomological Society.

Mr. Carter's loss will be keenly felt by naturalists in the Bradford district. He had a charming personality, and was ever ready to encourage and help beginners, and in so doing he spared himself no pains. His enthusiasm was positively infectious. In assessing a man's life-work, help rendered to others and the force of inspiration must be taken into account. When a beginner who came within his orbit had mastered the rudiments of any branch of Entomology, it was Mr. Carter's custom to take the recruit over to Huddersfield for an introduction to his friend, Mr. G. T. Porritt. There, meetings proved profitable and inspiring. Mr. Carter and Mr. Porritt

were the two oldest members of the Yorkshire Naturalists' Union.

During his life Mr. Carter amassed a large collection of objects of Natural History, and it is to be hoped that his collection will find a permanent home in the City of his adoption. He possessed also a choice library of Natural History books, especially those relating to Entomology.

He leaves a son and three daughters, and a host of friends to mourn his loss. His remains are interred in Heaton Cemetery.—R. B.

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Little Auk near Silsden, Yorkshire.—A Little Auk was picked up on the farm of Mr. Jonas Clarkson, Crossmoor, near Silsden, on January 19th, 1921, in a very exhausted condition. It died before night. On the two preceding days there had been a strong westerly (W.N.W., I think) gale blowing.—M. LONGBOTTOM, Silsden, 1st February, 1921.

Grouse in Harrogate.—During periods of exceptionally severe weather we have frequently had parties of grouse in and around Harrogate, sometimes in big numbers. This winter has been exceptionally mild, and one does not expect to find grouse away from the moors. Two birds, however, were in a little valley behind my house on January 30th, the nearest nesting ground is about three miles away west, and it is difficult to imagine what can have caused them to wander from their usual haunts in such mild weather. A strong westerly wind had been blowing for a day or two.—R. FORTUNE.

Feeding Habit of the Great Spotted Woodpecker.—I have observed, during the last few days, an interesting feeding habit of the Great Spotted Woodpecker. I heard a hammering noise, and saw a Great Spotted Woodpecker (male) very busy on a beech tree near, pecking a fir cone, going systematically between each scale. To find a fir cone fixed apparently firmly in a beech tree excited my curiosity (the bird did not hold the cone in any way, but climbed round it on the branch), and on closer investigation I found the base of the cone was firmly jammed into a crack on the tree with the point of cone projecting outwards. The cone had evidently been fixed by the bird. On the first day I saw the Woodpecker, one cone was fixed in place, but on the next day two cones were in place, and later the first cone was thrown down. At the base of the beech tree I found six or eight cones, the scales of which were pecked apart and the seeds extracted. The nearest fir tree bearing cones was at a distance of fourteen yards, the height above ground where the cone was fixed in the tree was fifteen feet.—BERNARD STRACEY, M.B., Simmenthal, Switzerland, 27th January, 1921.

FIELD NOTES.

BIRDS.

Corncrake near Workington.—Mr. T. Kendal, game-keeper on the Workington Hall estate, reports that on January 3rd he shot a Corncrake on Clifton Moor, near Workington. The bird was in an excellent condition.—RILEY FORTUNE.

Breeding of the Short-eared Owl near Wilsden.—A few weeks ago I called at the house of the late Arthur Oliver, a local taxidermist, and his widow shewed me a pair of Short-eared Owls and three young—originally there were four—which her husband had shot on Blackmoor, between Denholme and Haworth. Mr. Oliver had seen both young and old flying about the moor for two or three months; there is every reason to believe they had bred there. The nearest places to Wilsden in North-west Yorkshire where it is reported to have bred are the Otley Moors, near Skipton, and near Malham, but no particulars are given as recorded in 'The Birds of Yorkshire.' A few other places are mentioned of this species breeding in other parts of Yorkshire, but it can only be regarded as a scarce breeding species in Yorkshire.—E. P. BUTTERFIELD.

It is hardly possible to fix the exact date of this interesting occurrence, but it was probably about 1916 or 1917.—ED.

Eagle in West Yorkshire.—I read, with interest, Mr. Chislett's note in *The Naturalist* for February, as I had seen the bird. My first impression, on account of the very dark plumage, was the same as Mr. Chislett's—that it was a Golden Eagle, but a little later we had a much better view, and then decided that it was an immature White-tailed Eagle. There was a little white or very pale grey on the tail, towards the base, but this is quite consistent with a young *H. albicilla*, whereas a Golden at the same age should have shown much more white and a distinct dark distal band. Had it been a mature Golden Eagle, or one approaching maturity, with an almost wholly dark tail, it would surely have shown a lighter head and nape, whereas the head and neck of the bird as we saw it at fairly close quarters was as dark as the rest of the plumage. When the bird careened, showing its under parts, Capt. Boyd thought that there was more yellow on the legs than would have been visible on the toes alone of a Golden, and when it was a little further away, and dropped its legs for a moment to threaten an annoying Hooded Crow, Mr. Hadfield thought that the tarsi were unfeathered. We have examined skins in the Dresser collection, and though there is always some uncertainty about such variable birds as Eagles when only seen on the wing, we are satisfied in our own minds that it was a White-tailed and not a Golden Eagle. When the bird passed rather below our level the tail did not show the white basal

portion with a dark tip so characteristic of the young Golden, but merely rather indistinct whitish patches on some of the central feathers. Indeed, these markings were so inconspicuous that my companions, who were concentrating their attention on the legs, did not notice them.—T. A. COWARD.

The question of identification is definitely settled, but unfortunately in a most unsatisfactory manner. Several persons, in addition to Dr. Shipton, have reported the bird to be a White-tailed Eagle. After being at large, unmolested for some weeks, we understand that the keeper who shot the bird, found its roosting-place and laid in wait for it returning. It is a great pity that this ceaseless destruction of rare birds cannot be prevented, and we trust that the vandal who slew this bird may be brought to book.—R. F.

Arrival of Migrants in the York District, 1920.—

March 30th, House Martin, Ripon ; April 1st, Dringhouses ;
April 21st, Cattal.

April 2nd, Sand Martin, Dringhouses.

„ 9th, Chiff Chaff, Dunnington ; April 21st, Whixley.

„ 9th, Cuckoo, Dunnington ; April 18th, Crayke ; April
24th, Askham Bog ; April 30th, Grimston.

„ 14th, Yellow Wagtail, Dringhouses ; May 9th, Dunnington.

„ 15th, Swallow, Haxby.

„ 16th, Willow Warber, Heworth.

„ 18th, Whitethroat, Crayke ; April 29th, Skip Bridge ;
May 1st, Huntington.

„ 19th, Swallow, Sproxton, 28th, Sandburn ; May 9th,
York.

„ 20th, Whinchat, Wigginton.

„ 27th, Landrail, Duncombe Park ; May 7th, Dunnington ;
May 15th, York.

„ 28th, Wheatear, Sandburn.

„ 29th, Sedgewarbler, Skip Bridge.

„ 30th, Grasshopper Warbler, Askham Bogs.

May 1st, Tree Pipit, Huntington.

„ 9th, Meadow Pipit, large flocks on Clifton Ings.

„ 9th, Redstart, Strensall.

„ 9th, Sandpiper, Clifton Ings ; Swift, Fulford, York.

„ 12th, Spotted Flycatcher, Bishopthorpe.

„ 13th, Whinchat, Bishopthorpe and Wigginton ; 14th,
Dunnington.

„ 15th, Wood Warbler, Sandburn.

June 2nd, Nightjar, Sandburn ; Turtle Dove, Sandburn.

„ 8th, Stonechat, Gilling.—S. H. SMITH, York.

* Since writing the above I hear that the bird has been shot, and has been examined by Dr. Shipton ; it is an immature White-tailed Eagle.

ENTOMOLOGY.

South West Yorkshire Entomologists.—At the invitation of Mr. B. Morley, the members of the South West Yorkshire Entomological Society held their Annual Meeting at his house at Wind Mill, Skelmanthorpe, on January 16th, when Mr. B. Morley was elected President, and Mr. J. Hooper Secretary. The following exhibits were passed around. By E. G. Bayford : Orthoptera—*Periplaneta australasiæ* F. from Barnsley, Coleoptera—*Anthrenus musæorum* L. from Leeds ; by T. H. Fisher : Coleoptera—*Leistus fulvibarbis* Dej., *Ocys harpaloides* Serv., *Ontholestes murinus* L., *Staphylinus pubescens* DeG., *Corymbites pectinicornis* L., *C. cupreus* F. and var. *æruuginosus* F., *Xylotenus domesticus* L. and *Blaps mucronatus* Latr. from the Skelmanthorpe district. Mr. Fisher also showed a series each of *Bombyx quercus* var. *callunæ*, from Penistone Moors, *Pieris napi* and fine *Scopelosoma satellitia* from Skelmanthorpe district. By G. T. Porritt : Specimens of the newly separated *Pædisca sinuana*; *Sciaphila penziana* from Grassington, taken by W. G. Clutten, in 1911, the first recorded Yorkshire specimen; an almost clear white specimen of *Spilosoma menthastris*, specimens of the rayed variety *walkeris*, and the brown form from the north of Scotland; Scotch and English specimens of *Melanippe hastata*, along with a fine suffused variety from near Huddersfield. By Mr. H. D. Smart : A long series of English and Irish *Pieris napi* of both spring and summer broods showing a wide range of variation. By J. Hooper : *Argynnis paphia* var. *valezina*, and confluent *Zygæna trifolii* from the New Forest, and *Melanargia galatea* from the Isle of Wight. By E. Cocker, a brown suffused variety of *Arctia caia* from Huddersfield district in 1920. The evening was spent looking at the collection of lepidoptera made by the President.—B. MORLEY.

Lancashire and Cheshire Entomology.—A meeting of the Lancashire and Cheshire Entomological Society was held at the Royal Institution, Colquitt Street, Liverpool, recently, Mr. S. P. Doudney in the chair. A paper was read by Mr. S. Gordon Smith on 'A Year's collecting of Macro-Lepidoptera.' In this he related his experiences in pursuit of Lepidoptera from the autumn of 1919 until October of 1920. Delamere Forest came in for much attention, and the author obtained some lovely sets of variable insects; he showed that *Nyssia hispidaria*, previously considered rare in the forest, was quite a common moth, and had further established, by counting a large number of moths on the trees, that *Phigalia pedaria* var. *monarcharia* occurred in the proportion of about one to three of the type in this locality. The author had installed a

2000 c.p. lamp on the balcony of his house, overlooking the River Dee and the flat open country beyond. Records of temperature and weather were kept, and their bearing on the number of insect visitors noted. *Thamnonoma brunneata*, *Acronycta alni* and its black variation, *Cirrhoedia xerampelina*, and *Dicranura furcula* were among the species that came to the light. Mr. Carr exhibited a variable series of *Peridromia saucia*, also *Xanthia ferruginea*, *Calocampa exoleta* and *C. vetusta*, all taken in his garden at Alvanley on sugar or rotten fruit; from Princes Risboro', a series of *Thera juniperata*. ANNUAL MEETING, 20th December, 1920.—The President in the chair. The following were elected for the ensuing year, viz.:—*President*: R. Tait; *Vice-Presidents*: J. W. Griffin, S. Gordon Smith, S. P. Doudney, H. M. Hallett; *Hon. Treasurer*: J. Cotton; *Hon. Librarian and Assistant Secretary*, C. P. Rimmer; *Hon. Secretary*: Wm. Mansbridge. The President read an address on "The Lepidoptera of Wicken Fen."—WM. MANSBRIDGE, *Hon. Sec.*

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Leeds Natural History Records.—Among the records for the Leeds Naturalists' Club during 1920, the following principally relate to groups on which little work has been done previously:—

Vermes (from the immediate neighbourhood of Leeds).—Trematoda: *Distomum hepaticum*, *D. cylindraceum*, *Polystomum integerrimum*. Cestoda: *Dipylidium caninum*, *Taenia marginata*, *T. crassicolis*, *Cysticercus pisiformis*, *C. bovis*, *Coenurus serialis*. Nematoda: *Ascaris mystax*, *Strongylus auricularis*, *Oxyurus equi* var. *curvula*, *Rhabdonema nigrocenosum*. Gordiidae: *Gordius aquaticus*.—E. PERCIVAL.

Myriapoda.—Chilapoda: *Lithobius forficatus*, Leeds University Garden; *Geophilus longicornis*, Farnley and University Garden. Diplopoda: *Blanjulus pulchellus*, wheat, Manor Farm, Garforth; *Julus terrestris*, Bolton Abbey and Manor Farm, Garforth; *J. nemoralis*, Manor Farm, Garforth; *Glomeris marginata*, Bolton Abbey; *Polydesmus complanatus*? Manor Farm, Garforth. Collembola: *Lipura fimetaria*, scabbed potato, Garforth; *Lomocerus plumbens*, parsnip roots, University of Leeds; *Achorutes* sp., soil of wheat field, Collingham Bridge; *Podura* sp. potatoes and parsnips in Leeds University. Thysanura: *Campodea staphylinus*, Leeds University garden; *Lepisina saccharina*, Leeds.—H. W. THOMPSON.

Mollusca.—*Planorbis albus*, Leathley; *P. fontanus*, Leathley; *Limnæa auricularia*, Leathley; *Sphaerium corneum*, Wharfe at Arthington; *Paludetrina jenkinsi*, pond at Middleton.

These species have extended their range in the Leeds district. *Vertigo pusilla* has been found at Spofforth, thus verifying a record of forty years ago. *Limnæa peregra* seems to be decreasing in numbers in the Wharfe at Arthington, while *Paludetrina jenkinsi* is multiplying rapidly. Outside the Leeds area, but of interest, are *Acanthinula lamellata* and a white specimen of *Clausilia laminata* from Castle Howard.—GREEVZ FYSHER and H. W. HAYWOOD.

MOLLUSCA.

Early Mollusca at Middlesbrough.—My experience has been that slugs in anything like mild weather are as much astir and more destructive, if anything, to plant life in the early part of the year than at any other period. Noticing about Christmas time that some of my rare plants and early flowering Crocus species showed signs of their ravages, I had a hunt with a lamp on the evening of January 1st, and by looking over certain plants, found and killed 150 in a very short time, and over a very limited area, mostly *Agriolimax agrestis* and *Arion hortensis*, with a small number of the larger *Amalia marginata*; on two other nights within about one week I got 130 and 100 respectively. This pest has been worse this autumn and winter than usual, probably owing to the very favourable conditions for breeding during the past year. Autumn and winter flowering Crocus species have suffered especially badly, having the flower buds eaten into or very often eaten through at the lower part of the flower stem.—T. ASHTON LOFTHOUSE, Linthorpe, Middlesbrough.

The slugs mentioned by Mr. Lofthouse are the most destructive of our British species, but their ravages during the milder intervals in winter are more noticeable because of the scarcity of young and succulent growths at this period. Early spring, when all plant life is bursting into vigorous growth, is the season of the slug's greatest voracity, as all their vital functions are then in full activity, and all gardeners can testify to the myriads of seedlings they destroy at this time. Though many garden plants have had their ranker qualities more or less eliminated by selective cultivation, yet all plants are more or less efficiently protected from snails and other enemies by a wonderful variety of chemical and mechanical contrivances, so that it is likely that the ravages of these pests would become much more serious if the protective devices of the plant world could be more readily overcome.—JNO. W. TAYLOR, February 12th, 1921.

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MAMMALS.

Reported Occurrence of a Marten in the Levisham Valley.—Hearing that a Marten had been seen in the North Riding, I wrote to Mr. J. D. Tomlinson, who kindly replied as follows:—‘The locality is Levisham Valley, about 7 miles north-east of Pickering. About noon on the 13th October I was walking through a hill-side plantation about 300 yards from my house. The wood is generally quiet and is strictly preserved, and faces east. There is much natural cover. The trees are mostly Douglas Fir, Larch, Oak, Ash and Lime. There is a good flow of water from a spring

in the hill-side. I saw the animal when it was about 20 yards to my left, and at first took it for a Stoat in the thick undergrowth. It moved leisurely towards me, and then suddenly commenced to climb the bole of an Oak. When about 6 feet from the ground it seemed to change its mind, and jumped down again. Its general colour was bright russet brown, the extremity of the tail was black, or a very dark brown, and it appeared to be about 2 feet in length. I have never seen a wild Marten before, but I have no doubt that I am correct in identifying the animal as such. Although at one moment I got a good view of the face and muzzle, it appeared to me that the animal was without the lighter coloured patch of fur on the chest and throat. I had just previously fired a couple of shots within a few yards of where the Marten was seen, but these did not appear to have intimidated him in any way.' The Levisham Valley is in every respect a suitable harbourage for a Marten. In a subsequent note, Mr. Tomlinson says: 'I have no doubt at all of the identity of the animal which I saw, although I grant that I could not distinguish the light markings on the chest. My keepers, etc., are on the look-out, but nothing further has been seen of the animal. As we have not heard of any casualty we hope that it is still at large.'—R. FORTUNE.

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BOTANY.

Potamogeton panormitanus Ber. Biv. in South Lincolnshire.—In looking through a series of specimens of *Potamogeton pusillus* L. to determine as far as possible the distribution of the above species, I found that examples collected by my late friend Mr. H. Beeby from 'Deeping Fen, S. Lincoln, July, 1883,' must be referred to Bivoni's species. Dr. Hagstrom, in his 'Critical Researches in Potamogeton' (1916), p. 98-103, shows by an excellent account of the plant that it is a distinct species from *pusillus*; although the Italian botanists have always regarded it as merely a synonym of *pusillus*. The principal one of its differences, and one that can be easily seen in fresh specimens, is that the stipules (called ligules by Hagstrom) are connate, not split, as in *pusillus*; its growth also is different, and the winter-buds (called turios by Hagstrom) are much smaller and 'more gracile,' and these are produced more plentifully in the basal portion of the plant, not at the top as in *pusillus*. Hagstrom refers the *P. gracilis* Fries. to Bivoni's plant, and this I named *P. Noltei* (*Journ. Bot.*, 1890, 300), as there was a previous *gracilis* of Wolfgang. What is now wanted is that all specimens of *P. pusillus* L. should be examined to decide to which they belong, *i.e.*, *pusillus* or *panormitanus*.—A. BENNETT.

REVIEWS AND BOOK NOTICES.

Nature Songs, by **J. Clements**. London: Hunter & Longhurst, 208 pp., 4/6 net. We have been wondering why these have been called Nature Songs. They are dedicated to boys who fell in the war, there is a foreword by Mother Kate, there is a tremendous collection of poems—of various kinds—all with a strong religious flavour—some would make good hymns—but, speaking as a naturalist, we think the title misleading.

Natural History Studies, by **J. Arthur Thomson**. A. Melrose, Ltd., 254 pp., 7/6 net. In this Prof. Thomson supplies a medley of nature studies in his inimitable style—many being illustrated. His forty stories are arranged according to the seasons, and the variety of subjects dealt with can be gathered from the following headings to a few of the chapters:—‘Tale of the Tadpoles,’ ‘Caterpillars,’ ‘Internal Economy of the Sea,’ ‘Living Lights,’ ‘The Big Trees,’ ‘Seed Scattering,’ ‘Horned Lizards,’ and ‘The Otter.’ There are nearly thirty suitable illustrations.

Countryside Rambles, by **W. S. Furneaux**. G. Phillip & Sons, 186 pp, 3/6 net. This author’s methods are well-known. He selects a series of attractive photographs of animal and plant life and explains them in simple language. Like the preceding volume, this is divided into four parts, representing the seasons, and there are seven chapters to each season. The book commences with 46 plates on which are represented various phases of natural history objects, principally botanical. Our copy has a huge rubber stamp on the title page to the effect that it is a presentation copy; consequently, as we can hardly give it away, and are not likely to raise a shilling on it, we have had to put it where a lot of MSS. go to.

The R.T. Society, 4 Bouverie St., has issued **Beautiful Butterflies of the Tropics: How to Collect Them**, by **Arthur Twydale** (103 pp., 12/- net), which is a collection of finely printed representations of gorgeous butterflies, from four to eight or nine on a plate, usually the background being represented by scenes in New Guinea, Madagascar, or other similar far-off places where these butterflies do congregate. The main feature of the book consists of these plates, mounted on tinted cards, though the author gives nine interesting chapters dealing with the life history of the Butterfly; How to distinguish a Butterfly from a Moth; How to collect, and then describes insects to be met with in different tropical climes. The volume would form a welcome gift book, and illustrates the more familiar exotic species.

Zoology: An Elementary Text Book, by **Sir A. E. Shipley and Prof. E. W. MacBride**. Fourth edition. Cambridge University Press, 752 pp., 20/- net. The fact that this volume has reached its fourth edition is sufficient guarantee of its excellence, even without the names of the authors. What we cannot understand is how the publishers are able to produce such an excellent work, well printed on fine paper, and with nearly 400 illustrations, for the low price charged. The most important changes in the new edition are the incorporation of Prof. Jennings’ observations on the motion of Amoeba (Prof. Rhumbler’s hypothesis being now discarded), the inclusion of new results on the physiology of the bivalve Mollusca; the adaptation of Dr. Ridewood’s results on the development of centra; and the re-writing of the section dealing with human races in accordance with the views of Ripley, Elliot-Smith and Keith.

Some Experiences of a New Guinea Resident Magistrate, by **Capt. C. A. W. Monckton**. John Lane, 337 pp, 21/- net. When we saw a portrait of ‘the author’ in a nice new khaki suit as frontispiece, and learned from the title that he was ‘F.R.G.S., F.Z.S., F.R.A.I., sometime official member of executive and legislative councils, resident magistrate and warden for goldfields, high sheriff and high bailiff, and

senior officer of armed constabulary for H.M.'s possession of New Guinea' (with apologies if we have not inserted enough capital letters), we were prejudiced against the book. 'Swank,' we said to ourselves, and we gathered he was a Mason. But when in his preface he wrote: 'I do not pretend that the book possesses any scientific value,' we became more tolerant, read on; though the good impression this admission made was counterbalanced by the statement that 'only once in my life have I felt that a man was my master in every way.' However, reading on, one gleaned much of interest to naturalist or student of human nature; and certainly the author has many good stories to tell—we hope they may all be true. There are many illustrations from photographs, several being of distinct ethnographical value. There is a good index.

The Origin of Man and of His Superstitions, by Carveth Read. Cambridge University Press, 350 pp., 18/- net. 'This volume explains in its first part an hypothesis that the human race has descended from some ape-like stock by a series of changes which began and, until recently, were maintained by the practice of hunting in pack for animal food, instead of being content with the fruits and other nutritious products of the tropical forest. The hunting-pack thus being the first form of human society, two further questions are discussed: (1) Under what mental conditions did the change take place from the organisation of the hunting-pack (when this weakened) to the settled life of the tribe or group? and (2) Why is the human mind everywhere befogged with ideas of Magic and Animism?' While the preceding well describes the scope of this work, it does not give any idea of the fascinating way in which it is written, nor does it explain the wealth of material which the author brings forward in support of his ideas. His chapters on Magic and Animism, Omens, Totemism, etc., are remarkably fully and clearly written.

The Country Day by Day, by E. K. Robinson. New edition, 371 pp. London: Holden and Hardingham, 12/6 net. Perhaps the most generous way to deal with this volume is to give extracts from the circular written by the publishers, or by the author? merely adding that we don't agree with them:—'No Nature Book was ever more favourably received by the Press and Public than the first edition of this book. It contains a Nature article appropriate to every day in the year, being a selected compilation of the notes which the author contributed, for nearly three years, to *The Daily Mail*. Although many years have passed, the author still receives letters from correspondents saying they used to take the paper solely for the purpose of reading these notes. Mr. E. Kay Robinson's success has encouraged many imitators in the daily press, but 'The Country Day by Day' has really No Rivals. Open the book at any page, and you will find a literary cameo, perfectly descriptive of Nature's happenings, appropriate to that day. If you want to take and keep a bright and wholesome view of life, get a copy of 'The Country Day by Day,' and make a practice of reading one page of it every day. The difficulty is to stop reading when you have begun.'

Proceedings of the Yorkshire Geological Society, Vol. XIX., pt. 5. The part recently issued maintains the high level of the Proceedings of this Society. A melancholy interest is attached to two papers by geologists who have passed away, Dr. E. A. Newell Arber and Lieut.-Col. Wheelton Hind. The first paper, by G. W. Lamplugh, F.R.S., deals with a supposed raised beach at Saltburn, and describes recent sections made in the deposits. Some of the material is blown sand and rainwash, and the presence of shells is accounted for, some being regarded as relics of kitchen middens, and others as wind-borne. The terrace itself is referred to fluvial and not marine action. The paper furnishes a useful warning, showing the care necessary when claiming deposits to be raised beaches. The second paper by the late Dr. Newell Arber is concerned with the fossil flora of the southern portion of the Yorkshire

Coalfield. The first part of the paper, published about ten years ago, was devoted to the Middle and Lower Coal Measures of the extreme south of the coalfield in Notts. and Derbyshire. The present part is occupied with an account of the Middle Coal Measures flora in Derbyshire to the south of Chesterfield, the horizon of the plants discussed therein being the roof of the Silkstone Seam. A list of new records from this Seam is followed by a second and complete list of the species known from Bond's Main and Grassmoor Collieries. There are notes on the following species:—*Calamophloios verticillatus*, *Sphenopteris Potieri*, *S. Laurenti*, *Neuropteris obliqua* and *Stigmaria ficoides*. These notes are illustrated by three plates giving figures of the species. A biography is appended. Following this is a paper by the late Col. Wheelton Hind on some Carboniferous Ammonoids new to English rocks. Four species of *Glyphioceras*, namely *inconstans*, *obesum*, *corpulentum* and *complicatum*, have been found at Kniveton, Derbyshire, in beds of Carboniferous Limestone belonging to the Upper Carboniferous Beds of Vaughan's nomenclature. They are all new to England, though two have been recorded from Ireland. The zone is the lowest goniatite zone established in the Carboniferous system. Notes of the goniatites, and the specific characters of two of them are given, and the four species are figured in two plates. The establishment of goniatite zones is of the highest importance, as it is certain that such zones will be useful for correlation over wider areas than those based upon occurrences of corals and brachiopods. Unfortunately, though goniatites are common, they are often crushed beyond recognition, and it is satisfactory to find that the goniatites of this low zone are well preserved. The number concludes with a Bibliography of Yorkshire Geology for 1918-19, by T. Sheppard. Mr. Sheppard's name is a sufficient indication that this bibliography is full and accurate, and will be most valuable for workers at Yorkshire Geology.—J. E. MARR.

Transactions of the East Riding Antiquarian Society, Vol. XXIII., 1920. The contents of this number treat of matters ranging from prehistoric ages to late historic times. The first two papers, treating of the river-banks of Howdenshire and the artificial drainage of this district, are by Col. P. Saltmarshe. The author utilises his knowledge as physical geologist and geographer, antiquary and historian, in the solution of the problems with which he was confronted. He concludes that the Ouse and Humber in the area under consideration were not banked in artificially in Roman times, but that they had a definite low-water channel, and that embanking was begun by the Saxons, and especially the Danes, prior to 959, the river having been confined to its present channel as far as Howden or Kilpin by the middle of the 10th century. The section between Kilpin and Yokefleet was embanked between that date and the middle of the succeeding century, and from thence to Faxfleet west of the mouth of the Foulney in the twelfth century. A creek between Faxfleet and Brough was gradually filled in by deposit, but not embanked till a century later. He gives reasons for supposing that the tides of the Lower Ouse have recently increased in height. The second paper, of an historical character, deals chiefly with details of artificial drainage. A paper follows on Aldbrough Church, Holderness, by Mr. G. F. Twycross-Raines. It is shown that a church existed here in 1100, if not earlier. The various additions of different dates are described, the author being able to add information derived from the fortunate discovery of a water colour of the exterior made before the recent changes in the fabric in the latter half of last century. Illustrations of the interior and exterior are given, the latter reproduced from a water colour. A very interesting article by the editor, Mr. T. Sheppard, is devoted to the origin of the materials used in the manufacture of Prehistoric Stone Weapons in East Yorkshire. The materials from which the implements are made are chiefly derived from the local glacial deposits, though it seems likely that some of the implements were

actually imported in their complete form from abroad, as some, in the nature of their material and in their form, are precisely similar to those found in Denmark and Southern Scandinavia. It is interesting to note that as the flint of the Yorkshire chalk is unsuitable for manufacture of weapons, thousands of these have been made from flint brought from elsewhere to form boulders in the glacial deposits of the district. The paper, in addition to information concerning the materials of which the instruments are made, gives much that is new concerning the principal types, and these are illustrated by numerous figures. The author states that there are no palæolithic implements, and that it is difficult to place the others in actual order of date. It is possible, however, that among surface finds, upper palæolithic implements may be represented, as they are further to the south (see Sir J. Evans: *Ancient Stone Implements of Great Britain*, 2nd edition, p. 581), and the relative dates of the various neolithic and bronze-age implements may be determined in the future by comparison with the Scandinavian books, and reference to W. C. Brøgger's Classification. Any one writing on this subject must certainly study the fine collection arranged in the Hull Museum by Mr. Sheppard, and also the valuable Mortimer Collection in the same city. In doing so, he will find this paper of great utility. The number concludes with notes on some Roman Bronze Ornaments, on a Mediæval Badge, and on the Castles, Swine, signed T.S., and 'A new light on Old Hull,' by Mr. W. Stevenson.—J. E. MARR.

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The *Fifty-ninth Annual Report* for 1920 of the Yorkshire Naturalists' Union, reprinted from *The Naturalist* for January, is for sale by Messrs. A. Brown & Sons, at 1s.

The Annual Report of the British Numismatic Society announces a gift of £113 18s. 1d. from Mr. J. S. Salters, and an anonymous gift of £100, contributions towards the increased cost of printing the Society's Proceedings. Now, what about *The Naturalist*?

The Proceedings of the Liverpool Naturalists' Field Club for 1919 have recently been issued, and contain the Address of the President, W. H. Holt, on 'Two Giants' [William and Joseph Hooker], and Reports on the Field Meetings of 1919, which are very full, and carefully written.

Collectors of Yorkshire Oolitic fossils should consult a paper by Messrs. Richardson and Thacker 'On the Stratigraphical and Geographical Distribution of the Sponges of the Inferior Oolite of the West of England,' in the *Proceedings of the Geologists' Association*, Vol. XXXI., part 4.

Among the contents of *The Transactions of the Cardiff Naturalists' Society* for 1917, recently issued, are 'The Lepidoptera of Glamorgan,' by H. M. Hallett; 'Storm Burst in the Vale of Neath,' by F. P. Howard; 'Roman Remains, Cardiff Racecourse,' by J. Ward; and 'Meteorological Observations,' by E. Walford.

Mr. J. Edmund Clark and Henry B. Adames favour us with their 'Report on the Phenological Observations in the British Islands, from December 1918 to November 1919,' reprinted from *The Quarterly Journal of the Royal Meteorological Society* for October. We are glad to notice that Yorkshire has ten observers sending details as to the first appearances of animals and plants, which are annually tabulated in this valuable report.

Among the contents of *The Scientific Proceedings of the Royal Dublin Society*, N.S., Vol. XVI., we notice 'The Holothuriodea of the Coasts of Ireland,' by Anne L. Massy, and 'On the Inhibition of Invertase in the sap of *Galanthus nivalis* (Snowdrop),' by T. G. Mason. The same Society's *Economic Proceedings* contain 'Injurious Insects and other Animals observed in Ireland during the years 1916, 1917 and 1918,' by G. H. Carpenter.

CORRESPONDENCE.

NORTHERN BIRD NOTES FROM *THE FIELD*, ETC.

Col. T. B. A. Tuckey records (*The Field*, Jan. 15th) that he shot a Woodcock on Strensall Common on December 30th, weighing 14 $\frac{3}{4}$ oz. It was of unusually dark plumage. The average weight of a Woodcock is about 12 oz. Mr. Alfred Park, of Keighley, when out shooting on the banks of the Aire, near Saltaire, had a retriever which brought a Little Grebe found floating in the stream, from the mouth of which was a fisherman's cast and sinker. The bird had not been dead long, and was in good condition. The hook was firmly embedded in the windpipe. (*The Field*, Jan. 15th). Mr. Granville Farquhar, of Dalton Hall, Beverley, writes (*The Field*, Jan. 22nd) that on January 11th he flushed a Woodcock under a beech tree, on open grass 50 yards from the front door. He flushed another one in the middle of a bare grass field without a blade of cover and a hundred yards from any tree or hedge, and later in the same day two in the middle of a dry stubble field. From *The Yorkshire Weekly Post*, of January 22nd, we learn that a Grey Phalarope appeared in Filey Bay on January 13th.—R. F.

IS THE RING OUZEL A BRITISH RESIDENT?

IN 'The Handbook of British Birds,' by J. E. Harting (1872), the Ring Ouzel is stated to be 'Resident, nesting regularly in the west and north of England and throughout Scotland.' Can the Ring Ouzel be considered as a resident species of Britain? On reference to *The Zoologist* for 1879, page 203, Mr. Harting, after giving alleged instances of the Ring Ouzel having been seen in England in six counties in winter, goes on to state—'I am inclined to place it in the same category as the Pied Wagtail, Meadow Pipit, and I may add the Song Thrush, all of which, as we know, are to a certain extent migratory.' But surely these latter are not so migratory to anything like the extent of the Ring Ouzel, which in most years leaves Britain almost to a bird. If Mr. Harting had included, say, the Corncrake, and perhaps one or two others, in the same category, we should have been more inclined to have supported him. It is now nearly fifty years since the publication of Mr. Harting's work. I would like to ask, are there any more reasons now than formerly for including this species as a resident? I think not. Even of the six instances which Mr. Harting quotes, one, if not two, are doubtful. Although the Ring Ouzel breeds not uncommonly on all the high moors which surround us, perhaps not so commonly as in former years, I have never seen but one in winter, which was on Cottingley Moor, either on 25th or 26th December, and it is not at all improbable this bird might have left England later on.—E. P. BUTTERFIELD.

By no stretch of imagination can the Ring Ouzel be classed as a resident. It is well known that very occasionally individuals will stay throughout the winter months. The latest information given in 'A Practical Handbook of British Birds' (now in course of publication), Vol. I., p. 416, is, for England and Wales, Scotland, and Ireland, 'Summer-resident and passage-migrant, occasionally staying throughout the winter.'—R. F.

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At a recent meeting of the Leeds Naturalists' Club, Mr. E. Percival, B.Sc., exhibited a skull and fore limb from a porpoise cast up on the shore at Hayburn Wyke. Mr. R. W. Butcher referred to a recent article by the Rev. Woodruffe-Peacock in the January issue of *The Naturalist*, in which it was questioned whether *Scheuchzeria palustris* had ever occurred at Thorne Waste, where it was now extinct. Mr. Butcher exhibited a herbarium specimen from the collection of the late Robert Harrison, bearing the date 8th July, 1831, showing that the specimen had been found growing in pools in the central parts of the moor.

PEAT INVESTIGATION.

A MEETING of Members and Associates interested in this subject was held in the Geological Department, Leeds University, on January 12th, and as time proved too short an adjournment was called to February 11th.

At the first meeting Dr. D. Forsyth gave an interesting account of his work in preparing a bibliography of literature on Peat, and arrangements are being made by the Library Committee of the University to get together a selection of the most useful books.

Mr. W. H. Pearsall read a paper on 'The Significance of Buried Trees in Peat.' He referred to the work of Lewis, and suggested that the evidence in favour of considerable climatic changes was based on insecure grounds; in the first place he pointed out that to-day trees are found growing quite well at altitudes similar to those at which the buried trees of the Peat are found, he cited pines in Scotland at 2200 feet, and oak wood in the lake district at 1750 feet. The birch layers in Peat, he suggested, were probably due to local improved drainage which again got obstructed and peat formation resumed.

The so-called arctic layers of the Pennines were based on *Arctostaphylos*, which even now comes down to 600 feet, and *Empetrum*, which now occurs down to sea level.

He next drew attention to the increasing acidity of the soil in a series commencing with ash woods, then oak, next birch and pine, followed by moor with heather, etc., and finally the cotton grass Peats, his suggestion being that in suitable areas this would be the natural sequence. The topography of a district was an important factor, and an area like the lake district, with sharp hill spurs and deep-cut ravines, did not offer the stable conditions that are found on the Pennines, where the summits are flat plateaux with escarpments giving ideal conditions for the development of the Cotton Grass peat stage.

An informal discussion followed, and several points of interest were cited. Miss E. Whitaker found that at Harwood Dale, where pine stumps occur at the base of the Peat, pine pollen occurs throughout the whole thickness of the Peat, suggesting a uniform climate. The amount of change due to man's agency was also discussed, Mr. Pearsall having considered this as insignificant when describing the change from woodland to Peat. Cases were cited from Lyell and Geikie of overblown woods turned to morass, and mention made of forest clearance by the Romans both in Britain and on the Continent where this is recognised as a cause of Peat accumulation; also by Act of Parliament for the suppression of outlaws and wolves, by Edward I. in Wales, and Henry II. in Ireland. Gradual extinction of the hill woods would follow the destruction of the lower shelter belts.

It seems necessary to know the extent of the woods under the Peat, and any information will be welcomed by the Committee. References to the state of the country, the extent of woodland and of swamp, in the earliest manuscripts will also help to a better understanding of the various causes leading to the present conditions of our Peat covered hills.—CHRIS. A. CHEETHAM.

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An article on 'Economic Ornithology,' in *Bird Notes and News*, Vol. IX., No. 4, summarises recent papers on that subject.

Science Progress for January is as full of good things as usual, and well deserves its sub-title, 'A Quarterly Review of Scientific Thought.' Its contents are far too numerous ever to be quoted in the space at our disposal, but among the essays and articles the following may be mentioned as likely to be of especial interest to our readers:—'The Inheritance of Acquired Characters,' by Prof. MacBride; 'The Cytological Problems Arising from the Study of Artificial Parthenogenesis,' by D. Ward Cutler; 'The Soya Bean Problem,' by D. M. Atkins; and 'The Function of the Nucleolus in the Life of the Animal Cell,' by J. B. Gatenby.

NEWS FROM THE MAGAZINES.

J. P. Burkill writes on 'The Relation of Song to the Nesting of Birds,' in *The Irish Naturalist* for January.

Mr. H. F. Witherby gives interesting details of his 'British Birds' marking scheme in *British Birds* for February.

Some carved sperm whale teeth and bone are illustrated and described by Mr. T. Sheppard in *The Mariner's Mirror* for January.

E. N. Fallaize gives 'Suggestions for the Classification of the Subject-matter of Anthropology,' in *The Museums Journal* for January.

Moorland Grazing, and the Distribution of Wart Disease, are among many matters discussed in *The Journal of the Ministry of Agriculture* for January.

Mr. J. Wilfrid Jackson favours us with a copy of his paper 'On the Occurrence of Lusitanian Brachiopods in the Persian Gulf,' which appears in *The Ann. and Mag. Nat. History* for January.

Mr. T. D. A. Cockerell describes 'An Orthalid Fly in British Amber,' in *The Entomologist* for February; though from his remarks it seems quite possible that the species may not be British and the material may not be amber!

Gonepteryx cleopatra L. Has it more than one brood per annum? by J. A. Simes; and 'Coleoptera of Freckenham and Barton Mills again,' by H. Donisthorpe, appear in *The Entomologist's Record*, Vol. XXXII., No. 11.

Dr. Wm. Evans Hoyle has an article on 'Training and Diplomas for Curators' in *The Museums Journal* for February. This paper was read at the Winchester Conference, and the valuable discussion which followed is also printed.

'Bramblings in Westmorland,' 'Late Yellow Wagtail in Cumberland,' 'Migratory White Wagtails in Yorkshire in Autumn,' and 'Rate of Progress of Great Crested Grebe under Water,' are among the numerous items in *British Birds* for January.

H. Rowland-Brown, in *The Entomologist* for January, points out that *C. dispar* occurs in Holland, and a most careful examination of recent Dutch specimens results in it being impossible to distinguish them from the old English 'large Coppers' which formerly existed in the fens.

The British species of the *syldaticus*-group of *Pipinculus* (Diptera[]) are described by J. E. Collin, in *The Entomologist's Monthly Magazine*, No. 679; in No. 680 are notes on 'Coleoptera from Wensleydale,' and on 'Resting Positions of some Nematoceros Diptera'; the latter by F. W. Edwards.

Camping, for January, has a new design on the cover—the result of a competition; unsuccessful designs, all good ones, are reproduced inside. The magazine is full of the usual entertaining matter interesting to campers, and there is the Report of the Council, 1920-1921. The annual subscriptions amount to £468.

Discovery, the cheap and 'popular' journal, commences the New Year by changing the colour of the cover, doubling the price, and the editor discusses the problem as to whether Edwin Drood was murdered! He has recently spent a happy period in bed, and read the book, and he is quite sure, this time, of the author. It is Charles Dickens. Of course, the paper contains other notes as well—on rain gauge, Lord Lister, Land and Sea in Greek Life, and the Structure of the Universe.

'The Interglacial Problem and the Glacial and Post-glacial Sequence in Northumberland and Durham' is referred to by Dr. D. Woolacott, in *The Geological Magazine* for January. Contributors are warned that in future they must pay for illustrations to their papers, yet nearly half the January issue is occupied by part of a paper by Dr. Prieswerk on 'The Oil Region of the Punjab,' illustrated by numerous blocks and a large folding map—a paper which appeals to but few British geologists.

NORTHERN NEWS.

The death is announced of E. J. Spitta, the microscopist, at the age of 68.

The death is announced of James Reeve, who was for so many years Curator of the Norwich Museum.

The death is reported of H. H. Winwood, a well-known geologist in the west of England, at the age of 90.

The death of Michael Waller, of Hull, in his 77th year has occurred. He was a keen collector of natural history objects, and devoted much time in lecturing on his natural history rambles, to young people and others. He had a large collection of miscellaneous natural history objects.

The farmers of Northampton are asking the County Council to exclude the Lark from the Wild Birds' Protection Order. It is remarkable that they should be so careless of their own interests as to endeavour to exclude such a useful bird from the benefits of protection. The same body state that they suspect the Starling as a conveyor of foot and mouth disease, and upon these grounds, for which they have no justification, are urging the destruction of these birds.

More than a passing word is necessary on the death of Charles Edward Fagan, for many years one of the best-known figures at the Natural History Museum in London. For over thirty years he was Secretary, and year by year the administration was more and more thrust upon him until he broke down under the strain. He was only 65, had been in the service of the Trustees, we believe, 47 years, and was about to retire and enjoy a well-earned leisure. His loss will be severely felt by the Institution and by his numerous personal friends. Those interested will find an exceedingly able and correct appreciation in *The Field*, 5th February, p. 175.

The annual meeting of the Selby Scientific Society was held in the Museum Hall recently. Capt. C. H. March presided over a good attendance. The reports for the year were of a healthy and satisfactory character. The Society has now acquired a projection lantern. Mr. J. F. Musham read the Secretary's report, which recorded an increase in membership, and a total number of 165 on the books. The field meetings had been successful. Recordors for various sections presented reports: Botanical, Mr. J. B. Foggitt; Zoology, Mr. J. F. Musham; Photography, Messrs. T. Howden and A. Hutchinson. Mr. W. E. Hodgson presented the treasurer's report, which showed a satisfactory year's working, and that the small balance due on the lantern fund had been extinguished. The following were then elected for 1921:—President, Mr. A. Hutchinson; Secretary, Mr. J. F. Musham; Treasurer, Mr. W. E. Hodgson; Delegates to Yorkshire Naturalists' Union, Mr. W. N. Cheeseman, J.P., Mr. J. F. Musham, Mr. J. H. Brook.

There was a large attendance of members at the annual meeting of the Halifax Scientific Society, held recently. Mr. J. H. Lumb stated that the Society had had another successful year. At the end of 1919 they had a membership of 198, and they had lost four members by death, seven had resigned, and twenty-five new members had been elected, bringing the membership to 212. The average attendance at the lectures had been 93. A visit to the *Courier* office had been highly appreciated. Miss Percy (Hon. Treasurer) stated that they started the year with a balance in hand of £5 11s. 10d. Expenditure this year amounted, with their present balance in hand, of 15s. 7½d., to £33 14s. 2d. The Chairman, in moving the adoption of the reports, said that the lectures last year had been up to their usual standard. The membership of the society was higher than it had ever been before, and the attendances at the lectures had been good. The officers were re-elected as follows:—President, Mr. H. Waterworth; Hon. Secs., J. H. Lumb and H. E. Greenwood; Hon. Treasurer, Miss Percy.

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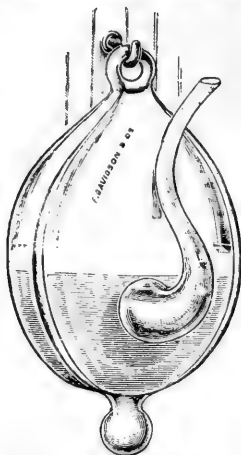
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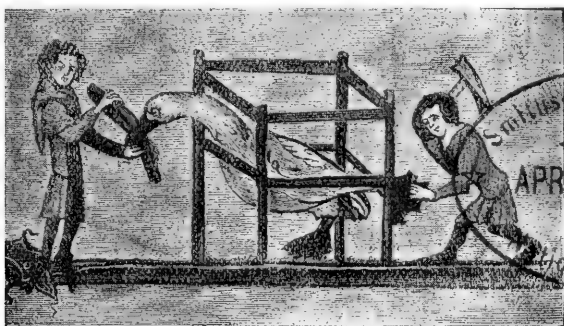
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NOTES AND COMMENTS.

EARLY ORNITHOLOGY.*

For generations naturalists have been indebted to members of the Gurney family for their sound and substantial contributions to ornithological science, but we must say that the work recently issued has appealed to us more than to any from the pen of a Gurney. He begins with prehistoric times—refers to cave paintings, etc. (not always reliable), and then takes us through the Bronze Age, and the various centuries up to the eighteenth. His notes on the birds of the Bronze Age might have been much more complete had he consulted the books dealing with barrows of the Bronze Age, by Mortimer, Bateman and others. Yorkshire and other Bronze-age tumuli



An Early 'Bird-Marking Scheme'!

have yielded at least three records of the hawk, and bones of the black grouse were found by Mortimer in a Yorkshire barrow.

MEDIÆVAL BIRDS.

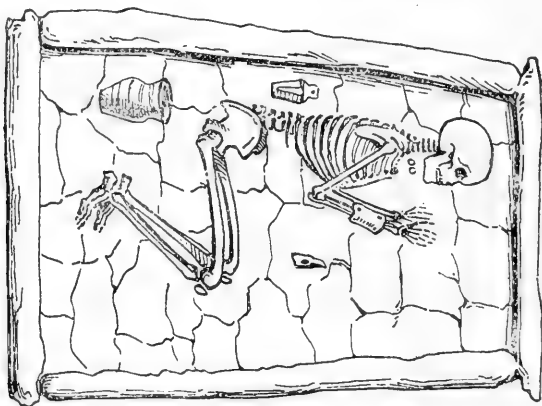
But it is relating to birds of early mediæval times that Mr. Gurney has collected so much quaint information from all manner of sources. Early 'Household Books' have been useful, though one of the most important he does not seem to have consulted, viz., 'The Northumberland Household Book,' of which there are three editions.† Illustrations from these records are given, and form a valuable and quaint collection; one of these the publishers kindly permit us to reproduce, though we trust their bird-marking scheme is not so drastic as was this method of marking swans in the fourteenth century.

* 'Early Annals of Ornithology,' by J. H. Gurney. Witherby & Co., 240 pp., 12/6 net.

† See 'Birds,' etc., 'used for food in the Sixteenth Century.' *The Naturalist*, February, 1906, pp. 52-56.

A BRONZE-AGE HAWK.

By the courtesy of the publishers of *The Naturalist*, we are able to give the illustration of the barrow near Driffield,* which contained the remains of a hawk. It was opened by the late Lord Londesborough in 1851, and besides the remains of the hawk (between the wrists and knees) contained two amber beads, a bronze dagger, an earthenware 'drinking-cup' and other typical Bronze-age relics. 'On the bones of the right arm was laid a very singular and beautiful armlet, made of some large animal's bone, about six inches long. . . . In this were two perforations about half-an-inch from each end, through which were bronze pins or rivets with gold heads, most probably to attach it to a piece of leather which had



passed round the arm, and had been fastened by a small bronze buckle, which was found underneath the bones,' no doubt the remains of a device for protecting the hawker's arm from the claws of the bird.

OIL WASTE AND MARINE LIFE.

A correspondent in a well-known 'Nature Lover's Diary' recently visited 'the Holderness coast, along a stretch some miles to the north of Withernsea. Along the upper part of the beach he found high-water mark defined by a line of disgusting large and small blobs of thick oil, having the consistency and tenacity of tar. So abundant was the oil that it was difficult to secure sufficient cast-up examples of the most common seashore animals and plants. Sea-mats, sea-firs, *Tubularia*, "bottle-brushes," red and brown seaweeds, ascidians on the roots of *Laminaria*, and skates' egg-cases were in plenty, but

* From Mortimer's 'Forty Years' Researches,' p. 274.

mostly untouchable. Under such conditions the study of marine biology will soon be hopeless. That is the student's point of view, but it does not require much imagination to think of the point of view of the important fishes who would find their food among such material in the sea, and of the sea-birds. The war put into every fishing-boat on the coast a motor-engine of one type or another, and the beautiful brown sails which were the joy of the artist on the coast have all but disappeared. But the fishing boats themselves in dispersing oil so abundantly, are smothering to death the small life on which the fish feed. It is regrettable—but not surprising, remembering what Government Departments are—to know that the Fisheries Department of the Board of Agriculture consider the killing of the goose not to have gone far enough yet to warrant their taking steps in the matter.'

KNOW YOUR FAULTS.

At the recent Annual Meeting of the Geological Society of London, the President, Mr. R. D. Oldham, F.R.S., gave an address with the above title. It was devoted to a consideration of the dangers of a loose use of words, especially to those of the common fallacy of homonymy. The first instance taken was that of the common classification of faults as normal and reversed. The nomenclature originated in a region where faults which hade to the downthrow are normal in the ordinary sense of the word; this was extended to other regions, and it became generally accepted that normal faults, in the technical sense, were normal in the dictionary sense, and, as a result of this double meaning of the word, the notion still lives on, though experience has shown that it is certainly not in accord with, and is very possibly the reverse of, the truth when extended from a special district to the world at large.

REVERSED FAULTS.

Reversed faults were then considered, and it was pointed out that, although they involve a reduction in the horizontal dimensions of the faulted region, they could only in special cases have been produced by simple horizontal compression. A consideration of possible modes of formation led up to the conclusion that the words upthrow or downthrow must be regarded as indicating no more than the relative displacement of the two sides of the fault, it being likely that simultaneous movement of the two sides took place in opposite directions, or in the same direction to different amounts.

OVERTHRUSTS.

Passing on to the special form of reversed fault known as an overthrust, the President pointed out that the word implied the two concepts, that the upper block was thrust over the

lower, and that its displacement was due to the action of some external fault. With regard to the former, there is no means of deciding, from observations within the area of the overthrust, whether the upper or the lower block had been displaced or remained stationary, so that all controversy on this point related merely to the words in which facts might be described. With regard to the latter, it was shown that in the larger overthrusts any general movement of the whole block affected, under the impulse of some external force, was physically impossible, whence it was deduced that the movements must have taken place piecemeal, and that the cause must have been generated within the area affected. As it is difficult to conceive of any such action taking place in the dead matter of the upper block, the conclusion is suggested that the originating cause lay in the lower, and the 'overthrust' becomes an 'undercrawl.' It was not suggested that any change in nomenclature should be introduced, as this would introduce new dangers; but these instances are sufficient to illustrate the necessity of remembering the difference between the technical and non-technical meaning of the words that we use, and to avoid the errors of reasoning which may arise from the use of the same word in more than one sense.

THE SCARBOROUGH MUSEUM.

We learn from *The Museums Journal* that 'the Philosophical Society of Scarborough is said to be desirous of handing its museum over to the Town Council. It is not said that the Council is equally desirous of accepting so expensive a gift. Whatever be the outcome, some responsible body ought to see that the collections of real scientific importance, find a safe house somewhere. Till a central museum council exists, the local educational authority, or, failing that, the Board itself, ought to keep an eye on the matter.' The present writer has been over to Scarborough more than once in connexion with this matter, and is satisfied the Philosophical Society is energetic and strong enough to look after its museum collections until such time as they become public property, and the sooner this happens the better for the public, and for education. The Society has nothing to gain but the thanks of all educated people for its generous suggestion. But Scarborough has not yet got a public library, so we cannot well expect it to be abreast of other towns in the way of museums.

THE MUSEUMS JOURNAL.

The Museums Journal is to appear quarterly in future, instead of monthly, for financial reasons. We think our museum friends have made a great mistake in this change, and curators will now only be acquainted with museum matters when their official organ appears every three months. If,

instead of the absurd waste of paper in the journal's present form, it were to revert to its old octavo size, and dispense with the unnecessary plates (one, in the current issue, is a good advertisement for Swedish industries, but of little value to English museum curators), the saving would probably enable the journal to appear monthly—even if a few pages dealing with the publication of foreign museums were dispensed with. Nearly eight pages in the current issue refer to foreign museums, and as this is the kind of thing which has, no doubt, brought about the suggested drastic curtailment, surely the simplest thing would be to dispense with it.

DR. W. EAGLE CLARKE.

We learn from Nos. 109 and 110 of *The Scottish Naturalist* that 'a few weeks hence Dr. W. Eagle Clarke will retire from the Keepership of the Natural History Department of the Royal Scottish Museum, and he thinks the time fitting also for his withdrawal from being one of the Editors-in-chief of *The Scottish Naturalist*. He intends to devote his leisure to the completion of new editions of Saunders' *Manual of British Birds* and Yarrell's more sumptuous treatise on the same subject. Since he was selected to edit the former *Scottish Naturalist* thirty years ago, he has taken a leading part in guiding the fortunes and maintaining the standard of it and its successors, the *Annals of Scottish Natural History* (1892-1911) and the present *Scottish Naturalist* (1912-), and his colleagues feel that no ordinary tribute is due to these prolonged labours for the cause of the nature knowledge of our country. Fortunately, Dr. Clarke will still give his services as an Assistant-Editor, and will continue to do all in his power to further the best interests of our magazine. Dr. Clarke's former place on the editorial staff has been taken, at the request of his colleagues, by Dr. James Ritchie, who has, since 1912, acted as an Assistant-Editor.'

VEGETATION OF ENGLISH LAKES.

Mr. W. H. Pearsall, one of the Hon. Secretaries of the Yorkshire Naturalists' Union, dealt with the aquatic vegetation of Gormire at a meeting of the Yorkshire Naturalists' Union last year. He has since carried out his studies on similar lines, the results of which have appeared in *The Journal of Ecology*. The most recent of these memoirs, prepared by the aid of a grant from the Royal Society, appears in No. 3 of Vol. VIII. of that journal. It is an excellent contribution to a new phase of botanical investigation, and is well illustrated. Mr. Pearsall concludes '(1) The distribution of the aquatic plants considered is primarily governed by the nature of the substratum, while the reaction of the substratum to vegetation is controlled by variations in the quality and

quantity of sediments deposited on it and by the type and quantity of organic matter it contains. (2) Light intensity may limit the depth to which types of vegetation descend, but is of secondary importance as a factor in the distribution of most of the plants considered. (3) Temperature conditions are assumed to retard the development of vegetation during early summer, but in other respects to be of little significance. (4) The absence of free floating vegetation is attributed to the paucity of the waters in essential plant food substances. (5) Plant succession is accompanied by changes in the substratum akin to those resulting in the formation of moor peat.'

GEOLOGISTS AND INTELLIGENCE.

The following extract is taken from a quotation by one Macintosh, which appears in Munro's 'Story of the British Race.' All we can hope is that this Macintosh is in heaven: in other words, that it was written many years ago. On the other hand it does not always follow that all F.G.S's. are deep-thinking geologists, nor that thoroughly informed geologists are all F.G.S's.:—'Along the borders of North and South Wales the people are naturally more intellectual than in any other part of England—Hertfordshire, Essex, Cambridgeshire and Hampshire perhaps excepted. In a long district running between Taunton and Oswestry, extending as far west as Hay and as far east as Bath and Bewdley, science, especially geology, receives at least ten times more attention than it does in any other equally-sized area. This conclusion I have arrived at from personal observation, and it is corroborated by the comparative number of Fellows living in the district whose names may be found in the list of the Geological Society. It is difficult to explain this fact without supposing it to be connected with the Welsh derivation of many of the inhabitants who may be regarded as Anglicised Welsh. It cannot arise from superior elementary education, for that is defective throughout the greater part of the district, neither can mining pursuits be the cause, for the working miners are not the most intelligent part of the population. In the adjacent parts of Wales where English is spoken, we likewise find a greater taste for solid knowledge than in the heart of England. The little and poverty-stricken town of Montgomery, with its immediate neighbourhood, contains more than a dozen thoroughly-informed and deep-thinking geologists; whereas a traveller might visit a dozen towns of the same size in Leicestershire, Lincolnshire, or East Yorkshire without meeting with a single geologist.'*

* According to *The Yorkshire Post*, a few days ago, Prof. Keith considers that 'people in the north think more than people in the south, and are more interested in scientific problems.'

NEW AND RARE YORKSHIRE LEPIDOPTERA.

T. ASHTON LOFTHOUSE, F.E.S.

THE following notes are of Lepidoptera taken in recent years for the most part in the Cleveland area, some of which are additions to Mr. Porritt's Yorkshire List, and almost all are additions to the Cleveland list. They are all 'microlepidoptera,' and some of the records are of species added to the British List in recent years, part of them due to the researches of Mr. F. N. Pierce and others who have worked at the 'genitalia' of many of the more obscure species. I have to acknowledge the kind assistance of Mr. John Gardner and Mr. F. N. Pierce in the identification of some of the species recorded.

**Scoparia crataegella*. Linthorpe, Middlesbrough.

**Tortrix rosana*. Mandale, Middlesbrough.

**Spilonota rosaecolana*. Kildale, 7/19. Three previous records for Yorkshire.

Mixodia palustrana. Cronkley, Upper Teesdale. A single specimen ♀ taken in July, 1919. Went up to the locality this last summer, but it rained almost incessantly all the time (3 days), and although only about a mile from where I was staying, I never got on to the ground. It has been taken freely on the hills on the Durham side of the Tees by Mr. J. Gardner, and is recorded in the Durham and Northumberland list.

**Phoxoberyx unguicella*. Ingleby Greenhow, 19/5/1918; also at Cronkley, Upper Teesdale.

**Phloeodes immundana*. Linthorpe, 7/1918.

†*Paedisca sinuana* Pierce. Among Birch, etc, Eston Hills, 19/8/1919.

I took two specimens of this, which were sent to Mr. Pierce, who says of them: 'the new *Sinuana*, the supposed variety of *Solan-driana*, but now proved to be a true species.'

Coccyx nanana. I have found this species common about some Spruce trees in the garden at Linthorpe, flying round the trees in the early evening, 6-30 to 8 p.m., from middle of July to middle of August.

**Endopisa nigricana*. Specimen taken in garden, Linthorpe, 7/1918. Second Yorkshire record.

†*Lipopteryx* [*Dicrorampha*] *aerata* Pierce. Recently described species, Lealholm, 6/1918. Ingleby Greenhow, 24/5/1917.

†*Eupoecilia affiniana*. Several about *Aster tripolium* in marshy ground near Grangetown Station, 14/6/1920.

**Tinea misella*. Ingleby Greenhow, 24/6/1917. Second Yorks. record.

**Tinea pellionella*. Beaten out of Firs in garden, Linthorpe, 7/8/1918.

**Adela croesella*. A specimen of this beautiful *Tinea* taken by M. Lawson Thompson at Ingleby Greenhow in June, 1918. Third record for Yorkshire.

†*Micropteryx sangii*. Among Birch in Basedale, 20/4/1913. Addition to Yorkshire list.

**Exaeretia allisella*. Specimen in garden, Linthorpe, 29/8/1919. Third Yorkshire record.

**Gelechia diffinella*. Great Ayton, 6/1918; Eston, 5/7/1918. Two previous records in Yorkshire list.

* Additions to Cleveland List. † Additions to Yorkshire List.

**Gelechia solutella*. Great Ayton, 10/6/1916. One previous Yorkshire record.

Gelechia affinella. Yearby, Eston, and Great Ayton, 7/1918.

**Bryotropha senectella*. Kildale, 1911. Mandale. Two previous records in Yorkshire list, one being Redcar, J. Sang.

**Lita fraternalis*. Kildale, 1915. Marton in Cleveland, about garden *Cerastium*.

†*Blastotere* (*Argyresthia*) *glabratella*. Off palings, near South Bank Station. Possibly from the Fir Woods on the Eston Hills, about two miles away. This species was first added to the British list by Lord Walsingham in 1906. *E.M.M.*, p. 169.

†*Cedestis gysselinella*. Great Ayton, July, 1913.

**Ornix torquillella*. Kildale, 6/1918. L. S. Brady.

†*Coleophora artemisiella* Scott. Among *Artemisia maritima* Cargo Fleet, near Middlesbrough. It is interesting to notice that this species was described by Scott, a gentleman who lived in Middlesbrough some time in the 'fifties' of last century, and it is possible it was described from local specimens. It is mentioned in Robson's 'List of Lepidoptera of Northumberland and Durham.' Vol II., Pt. 2, p. 197. Mr. Sang's records in his diary are all for Middlesbrough.

†*Laverna hellerella*. This species feeds on apple shoots and occurs fairly freely in the garden, Linthorpe, flying about the trees just before dusk, end of July and early August. This was identified for me by Mr. A. Sich, who also informed me that the Hawthorn-feeding species is *L. atra*.

Laverna atra. This is evidently the species included in the Yorkshire list as *L. hellerella*. It occurs freely on Hawthorn and Elm in early part of June, in the garden at Linthorpe.

Elachista kilimunella. Eston Moors, 8/1919; Glaisdale, 8/1920.

E. nigrella. Cronkley, Teesdale, 5/6/1916.

**E. megerlella*. Ingleby Greenhow, 27/7/1918. Two previous records in Yorkshire list.

**Cemiosoma spartifoliella*. Common about Broom, at Kilton, Lealholm and Sleights.

†*Cemiosoma waillesella*. Taken on and about *Genista tinctoria*, Saltburn, 7/4/1914.

†*Opostega salicella*. Middlesbrough, Acklam.

—: o :—

Hen Harrier at East Cottingwith.—I regret to report the death of a female of this species as having occurred at East Cottingwith about February 19th, 1921. I saw, and identified, this bird in the flesh, previous to its being handed to the Taxidermist.—SYDNEY H. SMITH.

Scheuzeria palustris L. in Thorne Moors.—I think Mr. Butcher (*The Naturalist*, March, p. 117) has misunderstood Rev. Woodruffe-Peacock's notice of the plant. He does not deny its occurrence there, but asks if there are any specimens extant from there. How he quotes me for the non-knowledge I do not understand. There are specimens in Mrs. Robinson's herbarium gathered in 1847, in the Brit. Museum Herbarium, and I possess one gathered by John Bohler in 1850. Fortunately, though nearly extinct in England, it is still in fair abundance in Perth and Argyll, in Scotland.—ARTHUR BENNETT.

THE SWARMING OF COLLEMBOLA.

JAMES MEIKLE BROWN, B.SC., F.L.S., F.E.S., F.C.S.

THE peculiar phenomenon, caused by the presence of small *Collembola* of the genus *Achorutes* (*A. socialis*, *A. cocklei*, etc.), which occur at times in such enormous numbers as to colour the surface of the snow over considerable areas in Canada and Northern Europe, is well-known from the writings of various authors (Linnaniemi, Folsom, Macnamara, etc.). The extraordinary numbers of these small insects, whose length may reach 2 mm., which must be associated together to produce the effect is very remarkable. Mr. Macnamara states that 'the vast swarms of *A. socialis* literally blacken square yards of the snow around the principal foci from which they emerge,' and that 'in depressions in the snow, such as foot-prints, they accumulate in solid masses.' He further describes the emergence of swarms of the same species from a decaying trunk 'from which they were issuing in solid blue masses.' (*Canadian Naturalist*, LI., November and December, 1919.)

In our own country 'snow-fleas' do not occur, and we never have the opportunity of witnessing such vast hordes of *Collembola*; yet, to a more limited extent, a somewhat similar swarming may be noticed among some of the more common species.

Podura aquatica L. thrives on the surface of water in small pools—cattle-pools seem to be a favourite situation in Derbyshire—and during the summer months they become so numerous that they form a bluish-black marginal belt of varying width of actively-moving creatures, especially on the lee-side of the pool. A similar appearance may sometimes be noticed produced by other aquatic species. In July, 1918, the margin of a small pool, partly shaded by trees, in the Hack-Fall Wood, near Masham, Yorkshire, was simply alive with the very small, pale yellow-green *Sminthurides malmgreni* var. *elegantula* Reut., in association with *Isotomurus palustris* Mull. There must have been enormous numbers of individuals present, both mature and immature. Similar swarms of *Anurida maritima* (Guer.) Laboulb. may also be seen in rock-pools at low tide at various places round the coast, e.g., Filey, Robin Hood's Bay, etc. In cases such as these, the rapid multiplication of individuals during early summer, associated with the limited extent of their habitat, and their very restricted powers of migration, appear sufficient to account for the formation of the swarms.

Occasionally the swarming is undoubtedly to be associated with a plentiful food-supply of limited extent. Such a case

was noted in August, 1919, at Robin Hood's Bay, where on several large pieces of decaying sea-weed immense numbers of *Achorutes viaticus* (Linn.) Tullb. were congregated; so densely were they crowded together that the surface of the weed was completely hidden over several square inches, and thousands of insects must have been present.

In October, 1918, *Sminthurinus aureus* var. *ochropus* Reut. was found in great numbers on an old stone wall at Beauchief, near Sheffield, and on October 24th, 1920, in the same locality, many swarms of *Achorutes purpurescens* Lubb. were discovered. In one particular case, several flat stones of a loose wall edging a field were to a great extent covered. A rough count over part of the surface gave approximately 200 insects to the square inch, but in places, much of the stone was quite hidden by clusters of individuals. The insects were either stationary, or were wandering to and fro in an apparently aimless fashion. The spot was visited the next day and also a week later, and swarms were still in evidence. Still larger numbers of the same species were found on November 6th, on a wall bounding a garden near Dore, where for a distance of thirty yards or more along the wall, crowds of individuals occurred, giving the upper stones a distinct bluish-black tint. It is impossible to give any estimate of the numbers present. Many of the individuals were immature.* The explanation is not obvious. There is no question of a possible migration here, as suggested by Mr. Macnamara in the case of the decaying trunk mentioned above, nor does the presence of a special food-supply seem likely on a bare wall. Probably their 'home' was in the crevices of the loose wall, or somewhere on the garden side in the last case, but why such numbers were apparently airing themselves at the same time is difficult to explain.

During the winter months, very large numbers of *Onychiurus armatus* Tullb. and *Dicyrtomina minuta* O. Fabr. and other winter species may be found on the under-side of fallen trunks and similar places in woods, but in such cases there is no suggestion of swarming such as has been described above.



Hull Museum Publication No. 122 deals with 'The Origin of the Materials used in the Manufacture of Prehistoric Stone Weapons in East Yorkshire,' is by Mr. T. Sheppard, and contains 46 illustrations of implements.

No. 86 of *The Journal of the Quekett Microscopical Club* contains 'Hydrocarina: the Genus *Eylais* Latr.,' by C. D. Soar and W. Williamson; 'A Log and some Mycetozoa,' by A. E. Hilton; 'The Desmid Flora of a Triassic District,' by G. T. Harris; and 'The Microscopical Structure of Lichens,' by R. Paulson—four excellent papers.

* Large numbers were again seen on the same wall on December 29th.

THE PHYSIOGRAPHY OF NORTH BRITAIN IN MILLSTONE GRIT TIMES.

W. S. BISAT.

THE publication of Dr. Gilligan's paper on the petrology of the Millstone Grits (*Q.J.G.S.*, Vol. LXXV., p. 251 *et. seq.*) brings up-to-date the pioneer work of Sorby in this field of research, and throws a flood of light on the occurrence and nature of the heavy minerals contained in the coarse grit beds. The large pebbles from the Middle Grits of the Silsden area are also most interesting, and are well illustrated by fine micro-photographs. It is to be hoped that other areas will also yield pebbles of like interest.

The restoration of the deltaic area of Grit times (illustrated by a map), is based on the petrological evidence, supported by current bedding. The coast lines shewn are in the main essentials the same as those adopted by Jukes Browne for the Lower Carboniferous ('The Building of the British Isles,' 3rd Edition (1911), Fig. 23), except that the map follows Roberts ('Introduction to Modern Geology, 1893') in omitting land to the east, and in its place is shewn a large river descending from the north through a considerable distance of what is apparently water.

The absence of a drainage system from the land to the north-west, and the acute angle the river to the east makes with the watershed, both look improbable, and it appears to the writer that the evidence for the Millstone Grits having entered our area from the north-east is not wholly satisfactory.

As stated above, the coast lines shewn are practically identical with those of *Lower Carboniferous* times. This hardly looks as if sufficient importance had been attached to the general regional uplift which ushered in the Millstone Grit period. This uplift must have had the effect of considerably reducing the area under water and bringing the north-west coast line of Lower Carboniferous times well down into Yorkshire. It is indeed quite probable that a land bridge across Ireland connected the north-west land with 'St. George's Land,' for Coal Measures rest directly on Carboniferous Limestone, near Kiltamagh in Mayo, (Jukes Browne, *op. cit.*, p. 177). There may, however, possibly always have been a narrow channel connecting the southern sea with the northern area, for the fauna of the marine bands intercalated in the Grits is of the southern (Pendleside) character. The only marine band containing the northern (Yoredale) fauna is the Cayton Gill band, and that is confined to the north-eastern corner of the Grit exposures.

Evidences of a 'non-sequence,' suggesting land in York-

shire in early Grit times are afforded in several areas. Preliminary oscillations produced rolled shell beds ('beach beds') at the top of D^2 , near Castleton, in Derbyshire (Barnes and Holroyd, *Trans. Mchr. Geol. Soc.*, Vol. XXV., p. 119), Winterburn Reservoir, Yorkshire (Tiddeman, *Proc. Yorks. Geol. Soc.*, Vol. XI., (1891), p. 490), Pythorn and Brockthorns, both near Slaiburn, and near Grassington, Yorkshire (Hind, *Proc. Yorks. Geol. Soc.*, Vol. XIV., pp. 428, 431, 432), and Newton Gill, Long Preston, Yorkshire (Hind and Howe, *Q.J.G.S.*, Vol. LVII., p. 360). It was a very uneven floor on which the Grit rocks were laid down ('Yorkshire Coalfield,' map facing p. 32). Around Great Whernside it very much looks as if a considerable thickness of the cherty beds of Swaledale had been cut out either by non-deposition or subsequent erosion, as the Basement Grit rests on beds well down in the Yoredale sequence (see Dakyns, *Proc. Yorks. Geol. Soc.*, Vol. XI., p. 358). The Pendleside Series thins out to nothing at about the latitude of Settle (see Hind and Hawe, *Q.J.G.S.*, Vol. LVII., p. 363), and by analogy it seems quite probable that the Grits themselves rapidly thinned out north of the Swale. It is not certain that the outliers on the mountain tops of the Wensleydale-Swaledale watershed are of early Grit Age. On the contrary they may be comparatively late.

The Pendleside Series is overlapped by the Grits, and the Grits are overlapped by the Coal Measures, all of which points to a relatively small area of deposit at first, gradually enlarged by subsequent depression. The absence of fresh-water shells in the Grits, and their abundance in the Coal Measures, suggests to the writer that the Grits are in the main estuarine, and the Coal Measures deltaic.

If the above suggestion be correct, it seems likely that the current bedding may be, in many cases, at right angles to the general axis of the estuary, and this may require to be borne in mind in considering this section of the evidence.

The field evidence of the Lower Grits shews that they thin in an eastern direction and become finer in grain, for example :

- (a) The Lancashire Grits (Pendle area) are much thicker than the Yorkshire Grits. (In this connection see Hull, 'On Isodiametric Lines,' *Q.J.G.S.*, Vol. XVIII., p. 127.)
- (b) The Basement Grit of Great Whernside, when traced eastward down Coverdale, rapidly becomes a mass of shales and thin sandstones (Dakyns, *Proc. Yorks. Geol. Soc.*, Vol. XI., p. 361).
- (c) The thick grits of the Bolton Abbey area ($K+P=2000$ ft. *vide* Survey 1 in. Geol. Map. 92 N.E.) thin to 1400 ft. of mixed grits and shales in the

Harrogate area (Geology of Harrogate, 2nd Edition, p. 5).

(d) The Cayton Gill beds are most calcareous in the easternmost exposures, as at Fountains and Tanfield.

(e) In the south of Yorkshire, near Sheffield, the Grits become so much finer in grain eastward as to resemble Coal Measures. (See *Geol. Surv. Mem.*, Yorkshire Coalfield, pp. 38, 39, 45, 46, 47, and Plate 2, Figs. 1 and 1A).

It is difficult to explain this attenuation and finer grain eastward on the hypothesis that the source of the material of the Grits lay in that direction. The clear water fauna of the Cayton Gill band in the north-east corner of the Grit outcrop also seems similarly against such an hypothesis.

Dr. Gilligan points out:—

(1) The resemblance of the Torridonian of Scotland, the Millstone Grits of the North of England, and the Sparagmite of Scandinavia.

(2) He states (*op. cit.* p. 286) that the Sparagmite was in all probability derived from the same source as the Torridonian.

(3) The Torridonian is believed to have been derived mainly from the north-west [*i.e.* from a land lying off the N.W. of Scotland] and in this Dr. Gilligan concurs (*op. cit.* p. 286).

If the Sparagmite or Torridonian both came from a land area to the N.W. of Scotland and are both closely allied to the Millstone Grit, it is difficult to understand why it should be necessary to assume that the Millstone Grits were derived mainly from a different source, as is suggested by Dr. Gilligan's map.

P.S.—Since writing the above notes, a short article has appeared in *The Yorkshire Post* ('The Lost Atlantis,' 3rd December, 1920) which reports Dr. Gilligan as stating that he has recently received rock samples from Newfoundland 'absolutely identical with the Millstone Grit, and the material of the rock, in several ways peculiar, was obviously from the same source as that of the English rock.'

This most important evidence throws further weight in favour of a north western as against a north eastern origin for our Grits, and is in line with the occurrence of rocks of Scandinavian type in Rockall, the similarity of the faunas of the Nebraskan Coal Measures and Scotch Millstone Grit, and the evidence adduced above.

Against this theory the only evidence of any weight appears to be the difficulty of a river passing over the mid-Scottish trough (Hind, *MS.*) and the occurrence in the grits

of a pebble of rhomb-porphry. These objections may be met, as to the first by assuming the river course passed to the west of the Scottish trough, or alternatively that the trough was filled by earlier sediments. In the absence of any precise correlation of the Scotch and Yorkshire beds, an opinion can hardly be formed. As to the second, whilst it is doubtless true that only in Scandinavia in the Northern Hemisphere have rocks of rhomb-porphyrific type been found, yet this Northland must have evidently been of such large dimensions, that rhomb-porphyrific areas may easily have existed further west.

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FIELD NOTES.

Large Grass Snakes at Harrogate and Ripon.—

During February a grass snake, measuring three feet eight inches, was dug up on an allotment at Harrogate, and in the same month three shared the same fate upon an allotment at Ripon. These last measured four feet two inches, three feet four inches and one foot six inches. The ones measuring four feet two inches and three feet eight inches are records for this district.—R. FORTUNE.

Bottle-nosed Dolphin in Norfolk.—Mr. John E. Auden informs me that in February he found a male Bottle-nosed Dolphin (*Tursiops tursio*) stranded alive on Blakeney Point, Norfolk. It measured nine feet in a straight line from nose to tail. He has the skull in his collection of mammals. In Carnarvon Bay, on the west coast, Mr. G. H. Caton Haigh tells me the species is common. A herd of them came up the Traeth Mawr on 18th August, 1919, and a young one, ten feet long, was stranded at Borth. He also informs me that a Dolphin (*Dolphinus delphis*)—a much rarer species in the west—was washed ashore dead at Harlech, on 22nd August, 1917; it measured 6 feet 1 inch in length.—H. E. FORREST, Shrewsbury.

Rose-Coloured Starlings in Holderness.—On January 20th, two Rose-coloured Starlings (*Pastor roseus*) were observed at Roos in Holderness, in company with a flock of Starlings (*Sturnus vulgaris*). Messrs. B. G. Jalland and H. Ringrose were driving on the high road, when their attention was drawn by the groom to two unusual birds perched in a bush on the roadside. The birds permitted a close approach, and were identified with certainty. The size was about the same as a Starling, with rose-coloured bodies, the one more brightly coloured than the other. No doubt they had come over in company with a flock of migratory Starlings, as a similar occurrence has been reported from the South of England this winter.—E. W. WADE.

FURTHER OBSERVATIONS ON THE OCCURRENCE OF MANGANESE IN LAND AND FRESH-WATER MOLLUSCA.

A. E. BOYCOTT.

SINCE the publication of the previous paper* I have been able to examine a considerable amount of fresh material, much of which I owe to the kind help of various correspondents, and especially of the late W. D. Roebuck. The number of species examined has been increased from 56 to 79, and much further information has been obtained about the occurrence of manganese in these already dealt with.

The data are briefly summarised in the table which shows the parts of manganese per 10,000 parts of dried snail body; 'trace' means less than 0.1.

- A. (a).—The helicids—18 species from *P. rotundata* to *H. hortensis*—have relatively little manganese. In 130 analyses from 122 localities a result of more than 5† occurred only once (*H. lapicida* from the Forest of Dean) and in 85 instances it was less than one.
(b).—The small bivalves, *Sphaerium* and *Pisidium*, also have very little, the highest figure in 11 analyses of the five species being 0.3.
(c).—The operculates, land and freshwater, similarly give low results, only once exceeding 2 in 17 analyses.
- B. (a).—Contrariwise, the large bivalves, *Unio*, *Anodon*, *Pseudanodonta* and *Margaritana*, uniformly contain large amounts,‡ 33 analyses from 22 localities ranging from 18 to 212.
(b).—*Buliminus* also ranges from 30 to 103 in 16 analyses, and *Zonitoides excavatus* gives the highest average. (173).
- C. *Clausilia*, *Succinea*, the aquatic pulmonates, *Dreissena polymorpha*, *Vitrina pellucida* and *Zonitoides nitidus* give moderate and rather variable figures.
- D. (a).—The slugs, as a whole, give much more variable results than the conchifers, and the mean figures may be high or low.
(1).—*Testacella* is usually quite low, though a *scutulum* from Berkhamsted gives 39.

* *The Naturalist*, 1917, pp. 11, 69.

† i.e., parts manganese per 10,000 parts dried snail body.

‡ As originally described by H. C. Bradley, *Journ. Biol. Chem.*,

III. (1907), 151; VIII. (1910), 237.

(2).—*Limax flavus*, *Agriolimax* and *Amalia* give moderate figures ranging from 0.5 to 36, but the means are under 10.

	Number of localities.	Minimum.	Maximum.	Mean.
<i>Testacella maugei</i>	2	2	3	2
<i>T. haliotidea</i>	2	0.7	0.8	0.7
<i>T. scutulum</i>	2	2	39	21
<i>Limax maximus</i>	26	0.4	56	13
<i>L. cinerconiger</i>	12	14	107	48
<i>L. tenellus</i>	6	41	151	94
<i>L. flavus</i>	10	0.5	36	6
<i>L. arborum</i>	30	0.8	270	58
<i>Agriolimax agrestis</i>	29	2	23	9
<i>A. laevis</i>	5	2	25	9
<i>Amalia sowerbyi</i>	8	1	13	6
<i>A. gagates</i>	6	0.5	18	6
<i>Vitrina pellucida</i>	3	1	3	2
<i>Hyalinia lucida</i>	5	5	23	10
<i>H. cellaria</i>	24	2	125	23
<i>H. helvetica (rogersi)</i>	21	5	133	31
<i>H. alliaria</i>	13	3	145	48
<i>H. nitidula</i>	14	2	199	35
<i>Zonitoides nitidus</i>	3	3	10	7
<i>Z. excavatus</i>	6	95	388	173
<i>Arion ater</i>	30	1	364	31
<i>A. subfuscus</i>	19	2	292	54
<i>A. minimus (intermedius)</i>	5	0.5	162	44
<i>A. hortensis</i>	17	2	228	29
<i>A. circumscriptus</i>	22	2	113	12
<i>Geomalacus maculosus</i>	1	—	—	64
<i>Pyramidula rotundata</i>	7	0.5	4	2
<i>Helicella virgata</i>	4	0.7	2	1
<i>H. itala</i>	4	0.4	1	0.7
<i>H. caperata</i>	4	0.3	0.7	0.5
<i>H. gigaxii (heripensis)</i>	3	0.7	0.8	0.7
<i>Cochlicella barbara</i>	1	—	—	0.8
<i>Theba cartiana</i>	9	0.4	2	0.9
<i>T. cartusiana</i>	1	—	—	2
<i>Ashfordia granulata</i>	1	—	—	2
<i>Hygromia hispida</i>	4	0.2	0.7	0.4
<i>H. rufescens (striolata)</i>	13	0.1	1	0.4
<i>Helicodonta obvolvata</i>	1	—	—	0.8
<i>Helicigona lapicida</i>	7	0.2	22	4
<i>Ariania arbustorum</i>	11	0.3	3	0.9

(3).—*Arion*, *Geomalacus* and the other species of *Limax* give high mean figures, but in each species specimens have been examined which gave quite low results (2 or less) except in *tenellus* and *cinerconiger*.

(b).—*Hyalinia* is similarly generally high and sometimes very high, but also sometimes quite low.

	Number of Localities.	Minimum.	Maximum.	Mean.
<i>Helix aspersa</i>	18	0.1	2	0.8
<i>H. pomatia</i>	1	—	—	2
<i>H. nemoralis</i>	17	0.1	2	1
<i>H. hortensis</i>	16	0.2	3	1
<i>Buliminus montanus</i>	2	55	103	78
<i>B. obscurus</i>	10	30	85	61
<i>Clausilia laminata</i>	1	6	10	8
<i>Cl. biplicata</i>	1	—	—	5
<i>Succinea putris</i>	2	2	6	4
<i>S. elegans</i>	3	3	3	3
<i>Ancylus fluviatilis</i>	4	3	21	9
<i>A. lacustris</i>	1	—	—	16
<i>Limnaea auricularia</i>	1	—	—	2
<i>L. peregra</i>	29	0.6	19	4
<i>L. stagnalis</i>	26	1	46	6
<i>L. palustris</i>	4	0.4	3	2
<i>L. glabra</i>	1	—	—	4
<i>Planorbis corneus</i>	4	1	21	6
<i>Pl. complanatus</i>	2	2	4	3
<i>Physa fontinalis</i>	2	3	8	6
<i>P. hypnorum</i>	1	—	—	trace
<i>P. heterostropha</i>	1	—	—	1
<i>Pithinia tentaculata</i>	4	0.3	1	0.7
<i>Paludina contecta</i>	1	—	—	0.5
<i>P. vivipara</i>	3	0.2	1	0.7
<i>Cyclostoma elegans</i>	5	0.2	1	1
<i>Neritina fluviatilis</i>	2	1	7	4
<i>Dreissena polymorpha</i>	3	2	6	4
<i>Unio pictorum</i>	3	19	36	26
<i>U. tumidus</i>	2	46	165	87
<i>Margaritana margaritifera</i>	4	38	212	116
<i>Anodonta cygnea</i>	8	24	113	58
<i>A. anatina</i>	4	18	46	30
<i>Pseudanodonta 'rothomagensis'</i>	1	48	73	60
<i>Sphaerium rivicola</i>	1	—	—	trace
<i>S. corneum</i>	4	nil	0.3	trace
<i>S. lacustre</i>	3	nil	0.2	trace
<i>S. pallidum (ovale)</i>	1	—	—	trace
<i>Pisidium amnicum</i>	1	—	—	nil

These results are, in general, the same as those reached before. The tendency or ability to accumulate manganese varies quite definitely in different genera and species. The present data show, however, more clearly than was then possible that locality has a considerable influence, especially in some species. The chief difficulty in getting clear-cut results on this point arises from the fact that the same locality does not

harbour the whole series of species which one would desire. If *Limax*, *Hyalinia*, *Helicella* and *Helix* in their several sorts would all live together in one habitat, a direct answer could be obtained; but they do not. We have only a few possible comparisons of helicids with more manganiferous species. Thus *H. rufescens* living with *Buliminus montanus* (78) in beech woods in Buckinghamshire or Gloucester keeps to the same low figure as it does in hedge banks and gardens elsewhere. Similarly *B. obscurus* always maintains a high level whether it lives with *Limax tenellus* or *Helix aspersa*. *P. rotundata* from the most manganiferous locality I have examined gave only 4 as against a general average of 2. In the only place in which I have been able to find *Helix nemoralis* and *H. hortensis* living alongside *Limax maximus* and *L. arborum* (a Wiltshire beech wood) the whole series of slugs and snails gave the low figures normal for the latter. *Zonitoides excavatus* gives consistently high results and has an average nearly twice as great as any other species. From two of the six localities (oakwoods at Bodmin=388, and Leeds=116) I have no other species. The other four loci give:—

	General Mean.	Maximum found.	Portmadoc, Carnarvon.	Romily, Cheshire.	Branscombe, Devon.	Southleigh, Devon.
<i>Zonitoides excavatus</i> ...	173	388	127	185	130	95
<i>Limax cinereoniger</i> ...	48	107	—	—	15	105
<i>L. arborum</i> ...	58	270	—	—	46	103
<i>Arion ater</i> ...	31	364	—	—	18	—
<i>A. subfuscus</i> ...	54	292	—	—	31	20
<i>Hyalinia cellaria</i> ...	23	125	71	—	14	—
<i>H. helvetica</i> ...	31	133	49	69	18	68
<i>H. altiaria</i> ...	48	145	43	71	—	67
<i>H. nitidula</i> ...	35	199	73	85	< 6	—

All these localities were, as usual, woods on non-calcareous soils and of oak or oak mixed. The figures show that *excavatus* has in each case accumulated a great deal of manganese, that there is a distinct tendency for other species from the same woods to give high, but by no means maximal figures, but that it may be found in places where the other sorts give no more than average figures. It would be interesting to know what *Hygromia fusca* does when it lives alongside *Z. excavatus*, but I have been unable to obtain specimens.

(To be continued).

YORKSHIRE COLEOPTERA IN 1920.

W. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H., F.E.S.

FROM the general tone of the reports on the season, it was expected that the Annual Report of the Coleoptera Committee for 1920 would be a very meagre one.

However, when the final survey comes to be taken, it is found that we can add eleven species, some of them very rare insects, to the county list, and the following enumeration of over a hundred interesting species contains many records which amplify the known distribution of other beetles in the county. Rather more notes than usual have appeared on the order in the pages of *The Naturalist* and other journals, and these should be consulted. Much help has been rendered by various naturalists who are not Coleopterists. The asterisk and dagger are used as in previous reports, and the initials given are by now well known to readers of *The Naturalist*.

Since the Annual Meeting of the Entomological Section of the Yorkshire Naturalists' Union in Leeds, the Committee deplores the loss of two valuable members—H. H. Corbett and J. W. Carter, as will be seen from the obituary notices in *The Naturalist*.

Notiophilus substriatus Wat. Harrogate, 5/20, A. E. Winter.

Bembidium saxatile Gyll. Northern form. Brignall Banks, Barnard Castle, M. L. T.

B. andreae F. v. *femoratum* Stm. Yore Banks, Aysgarth, G. B. Ryle (*65).

B. mannerheimi Sahl. Reeth, M. L. T. (Y. N. U., 5/20), *65.

B. atroviolaceum Duf. (*stomoides* Dj.). Tees banks, near Yarm, 8/20, M. L. T.

Amara consularis Duft. Allerthorpe Common, W. J. F.

Pierostichus æthiops Pz. Aysgarth, G. B. Ryle, *65.

Agonum gracile Gyll. Harrogate, A. E. Winter.

A. thoreyi Dj. Ryhill Reservoir, 5/19, W. S. F.

Cælambus impressopunctatus Schal. Thorne, H. V. Corbett, *63.

†*Dytiscus circumflexus* F. Saltend Common, near Hull, fairly commonly, 8/20, T. S., G. B. W. (see *Nat.*, 1920, p. 407). This species had not been recorded as far north previously. It is a South European species, and occurs chiefly in the London district and the Fens.

Helophorus arvernicus Muls. Brignall Banks, Banks of Greta, Barnard Castle, Sept., M. L. T.

Aleochara sparsa Heer (*succicola* Th.). Bubwith, in dead hen, 6/17, W. J. F., *61.

Stichoglossa proliva Gr. Saltburn, under bark, 1894, M. L. T., *62.

This insect was recorded as *corticina* Er. in *Proc. Cleveland Field Club*, 1898, but has since been determined by Mr. E. A. Newbery as the first named species (see M. L. T., *Proc. Clev. N. F. Club*, 1914-19, pp. 175-182). Mr. Thompson, in his list of additions, etc., brings the Cleveland total to 1070 species. He notes that *Philonthus pennatis* Shp. is the insect recorded from Cleveland as *trossulus* Nor. The latter is not a common species, and most of our Yorkshire records

- probably refer to *pennatus*, which is not uncommon in the Bubwith district. Also *Lathrobium geminum* Kr. (*boreale* Brit. Cat.) should be noted as the species previously recorded as *elongatum* L.).
- Stichoglossa corticina* Er. still stands in our list on a record from Filey, E. C. Horrell (Y. C. C. Report, 1914).
- Oxytoda spectabilis* Märk. Carter Knowle, Sheffield, 10/19, J. M. B., *63. This rare species is only on record from Studley and Scarborough district.
- Phlaeopora testacea* Mann. (*reptans* Gr.). Bubwith, 10/17, W. J. F., *61. Wykeham, G. B. W., *62.
- Atheta aqualica* Th. Bubwith, 6/17, in dead hen, W. J. F., *61.
- †*A. palustris* Kies. Bubwith flood refuse, Jan., 1915, W. J. F., a moderately common species.
- †*A. (Plagiarthrina) fordhamiana* Keys. Described as new to science by Mr. J. H. Keys on specimens taken in flood refuse. Bubwith (E.M.M., 1920, p. 131).
- A. crassicornis* F. (*fungicola* Th.). Bubwith, in flood refuse, and Ellerton, in fungus, W. J. F., *61.
- A. trinotata* Kr. See W. Falconer, *The Naturalist*, 1920, Aug., p. 248, for notes on the supposed parasitism of this species, on a dipterous puparium. Members of the closely related genus *Aleochara* have been frequently bred out from dipterous pupæ and the extension of the habitat to *Atheta* opens up a wide field for observation.
- †*A. luteipes* Er. Flood refuse, Bubwith, 9/19, J. H. Keys. Most of the records for this species are from the Southern half of England, but it has occurred in the Isle of Man and Ireland. It is a river bank and marsh loving species.
- †*A. decipiens* Shp. Bubwith, flood refuse, G. B. W. Another marsh species only previously taken rarely in the South of England.
- †*Atheta granigera* Kies. (*crassicornis* Gyll.). A male and female taken by J. M. B. in Sept., 1919, at Millhouses and Carter Knowle, Sheffield. This is a rare northern species, but has occurred on Chat Moss, near Manchester.
- Quedius nigriceps* Kr. Ecclesall Woods, Sheffield, J. M. B.
- Ontholestes tessellatus* Geoff. Deerhill Reservoir, Meltham, C. A. Cheetham (J. W. C.).
- Dianous coeruleus* Gyll. Not uncommon under stones in brook in Ecclesall Woods, Sheffield, 5/20, J. M. B.
- †*Stenus fuscicornis* Er. Two in wet moss, Brignall Banks, Sept., M. L. T. New to north of England; only known from London district previously, but very common in France.
- Lesteva heeri* Fauv. Forge Valley, not uncommon in moss, G. B. W.
- Homalium septentrionis* Gh. Scalby beck, one in flood refuse, G. B. W.
- Bythinus burrelli* Den. Scalby, G. B. W. (one of Lawson's Scarborough captures).
- Stenichnus scutellaris* Müll. Ecclesall Woods, Sheffield, J. M. B., *63.
- Catops watsoni* Spence. Raincliffe Woods, among dead leaves, G. B. W.
- Necrophorus humator* Goeze. Mr. G. B. Ryle records a small narrow aberration taken at Aysgarth with two small dark red spots on left elytron (E. M. M., 1921, 15).
- Xylodrepa 4-punctata* L. Ecclesall Woods, on oaks, not uncommon in early summer, J. M. B. This species also occurs in several woods in Derbyshire (near Sheffield).
- Silpha tyrolensis* Laich var. *nigrita* Crenzt. Bilton, near Harrogate, 6/20, A. E. W.
- Liodes cinnamomea* Pz. Raincliffe Woods, end of October, 4 examples in rain water pools on road, G. B. W. and A. E. W., *62.
- L. rugosa* Steph. Raincliffe Woods, one by night sweeping in late October, G. B. W.
- Epurza angustula* Er. Ecclesall Woods, April and May, in birch

- stump, J. M. B., *63. This species is parasitic on *Xyloterus* (*Trypodendron*) *domesticus* L. which occurred with it. The latter insect has also been taken at Shipley. H. H. Wallis (J. W. C.).
- Epuræa rufomarginata* Steph. Ecclesall Woods, one in May, J. M. B.
- Glischrochilus* (*Ips*) *4-pustulatus* L. Scarborough, one in flight, Wykeham, Silpho Moor, G. B. W. Seamer Moor, one under piece of wood, A. E. W. *62.
- G. 4-guttatus* F. Ecclesall Woods, May, June, J. M. B., on birch stump.
- Rhizophagus depressus* F. Ecclesall Woods, April, J. M. B.
- Cryptamorpha desjardinsi* Guer (*musæ* Woll.). Slaithwaite, in bananas, with *Anthicus floralis*, Sept., W. Falconer.
- Telmatophilus caricis* Ol. Sheffield, in cellar, J. M. B.
- Anthercaphagus nigricornis* F. Birk Crag, on meadowsweet, 7/19, A. E. W.
- Triplax ænea* Schal. Birk Crag, numbers in fungi on dead tree, February 1920, A. E. W.
- Lathridius bergrothi* Reit. Sheffield, in cellar, J. M. B.
- Pseudotriphyllus suturalis* F. Swinethwaite, in polyporus, G. B. Ryle, *65.
- Dermestes vulpinus* F. Leeds, W. D. Hincks, *64.
- Aphodius foetens* F. Hirst Woods, Bradford, H. H. Wallis.
- A. constans* Duft. ab. *martialis* Muls. The red form of the species, Middlesmoor, 6/19, H. H. Wallis.
- A. luridus* F. var. *gagates* Müll. Seamer Moor, several on dung, G. B. W.
- Phyllopertha horticola* L. Gill Beck, Wharfedale, June, J. W. C. Martin Beck Wood, W. J. F. and B. Morley.
- Corymbites pectinicornis* L. Deepdale, Barnard Castle, June, M. L. T.
- Limonium minutus* L. Leeds, W. D. Hincks, *64.
- Athous vittatus* F. Malham, J. W. C. Edlington, a black form, May, W. J. F.
- Hydrocyphon deflexicollis* Müll. Deepdale, June, common, M. L. T.
- Cantharis abdominalis* F. var. *cyanea* Curt. Deepdale, one, June, M. L. T. Ramsdale, G. B. W. Ryecroft Glen, Sheffield, J. M. B.
- C. paludosa* Fall. Birk Crag, June, A. E. W.
- C. rufa* L. var. *liturata* Fall. Ogden Moor, June, a small black form, H. H. Wallis.
- Rhagonycha translucida* Kryn. Birk Crag, June, A. E. W. Deepdale, June, M. L. T., *65. Wharnccliffe, June, J. M. B., *63.
- Malthinus frontalis* Marsh. Deepdale, June, M. L. T., *65.
- Malthodes mysticus* Kies. Wharnccliffe Woods, J. M. B.
- M. fuscus* Walth. (*pellucidus* Kies.). Ecclesall Wood, June, J. M. B., *63.
- Dasysaes aerisus* Kies. Ramsdale, two by sweeping, G. B. W.
- Gibbium psyllodes* Czemp. (*scotias* F.). Middlesbrough, M. L. T., *62.
- Niptus unicolor* F. (*crenatus* F.). Aysgarth, G. B. Ryle, *65.
- Ptinus tectus* Boield. Selby, abundant in cage bird food, August, J. F. Musham.
- Stenochorus meridianus* L. Bolton Woods, J. W. C.
- Leptura cerambyciformis* Schr. Wharnccliffe Woods, June, fairly common on elder and umbellifers, a dirty pale yellow form, H. D. Smart, J. M. B., W. J. F. This species also occurred again in Ecclesall Woods, J. M. B.
- Pogonocherus hispidulus* Pill. (*bidentatus* Th.). Hayburn Wyke, one, G. B. W.
- Stenostola ferrea* Schr. Edlington, one, June, H. D. Smart.
- Plateumaris affinis* Kung. Ellerburn, not uncommon on marsh plants, G. B. W., *62.
- Cryptcephalus fulvus* Goeg. Doncaster district, H. H. C.

- Chrysomela hyperici* Först. East Dale, South Cave, Sept., T. Stainforth, *61.
- C. varians* Schal. With the last on *Hypericum*, T. S., Grassington, Sept., J. W. C., *64.
- †*Phytodecta rufipes* D. G. Martin Beck Wood, W. J. F. (*Naturalist*, 1920, p. 259).
- Melasoma populi* L. Pilmoor, C. A. Cheetham (J. W. C.), *62.
- Galeruca tanacetii* L. Allerthorpe Common, several on *Scabiosa succisa*, Sept., W. J. F.
- Chalcoides fulvicornis* F. var. *pivicornis* Weise. Raincliffe Woods, common on willows, G. B. W.
- Phyllotreta flexuosa* Ill. Harewood, Gordon Caird.
- P. tetrastigma* Com. Ecclesall Woods, J. M. B., *63.
- Longitarsus ochroleucus* Marsh. Sheffield, on cabbage in allotment, 10/19, J. M. B., *63.
- L. gracilis* Kuts and ab. *poweri* Al. Common on ragwort, Brignall Banks, Sept., M. L. T., *65.
- Cassida nobilis* L. Wheatley Wood, May, H. H. C., *63. (only recorded from Marton Lodge, L. Rudd. (See Steph. Ill., iv., 370, and Fowler, *Brit. Col.*, IV., 400).
- Anthrribus variegatus* Fourc. Spruce fir, Deepdale, Barnard Castle, June, M. L. T., *65.
- Otiorrhynchus rugifrons* Gyll. Gill Beck, under stone, G. B. Ryle, *65.
- Strophosomus retusus* Marsh. Harrogate, A. E. W., *64.
- Barynotus squamosus* Germ. ab. *schönheyri* Zett. Harrogate, June, A. E. W. Winch Bridge, Teesdale, 5/19, M. L. T.
- Liosoma deflexum* Pz. ab. *collare* Rye. Seamer Moor, one in moss, G. B. W., *62.
- Phytonomus fasciculatus* Hbst. Flixton, G. B. W., *62.
- Dorytomus rufulus* Bcd. Ellerburn, G. B. W. The N. E. of Yorkshire is apparently the headquarters of this species in the county, though it also has been taken in v.c. 61 and 63.
- Mesites tardyi* Curt. Hayburn Wyke, G. B. W. (*Nat.*, 1900, p. 271). This species is recorded as being taken on the N. E. Coast in profusion by T. Wilkinson (see E. C. Rye, *Ent. Ann.*, 1869, p. 8).
- Cryptorrhynchus lapathi* L. Hayburn Wyke, not uncommon on willows, G. B. W.
- Cæliodes rubicundus* Hbst. Ecclesall Woods, J. M. B.
- C. dryados* Gniel. (*quercus* F.), with the above, *63.
- Allodactylus affinis* Pk. (*geranii* Pk.). Deepdale, common, June, M. L. T.
- Rhinoncus pericarpus* L. Sphagnum, near Slaithwaite, 9/19, W. Falconer, *63.
- R. perpendicularis* Reich. Selby, G. B. W. This insect was not uncommon at Bubwith, W. J. F.
- Phytobius 4-tuberculatus* F. Hayburn Wyke, G. B. W.
- Anthonomus conspersus* Desb. Second brood, very variable in colour on mountain ash at Stainton Dale and Hayburn Wyke, Sept., G. B. W. W. J. F.
- Anoplus roboris* Suf. Hayburn Wyke, on alder, G. B. W., W. J. F.
- †*Magdalis carbonaria* L. One specimen of this very local species by beating. Raincliffe Woods, G. B. W.
- M. armigera* Fourc. Edlington, June, H. D. Smart, *63.
- Apion æstivum* Germ. (*trifolii* Brit. Cat.). Flixton, in sand quarry, G. B. W.
- A. subulatum* Kirby. Sandsend, 5. R. Lucas (M. L. T.) *Trans. Cleveland Soc.*). The only previous Yorkshire record is by Walton in 1837. (see Fowler, V., p. 139).
- A. assimile* Kirb. Skipwith, G. B. W. Not recorded in the Victoria County History, but apparently overlooked. There are the following

records for the county—Yorkshire, Walton, 1837; Brough, E. B. Wigglesworth (*Nat.*, vi., 72). Whitby, E. B. W. (*Nat.*, 1882, 158). It also occurred at Middleton in Teesdale, 8/16, G. B. W.

Rhynchites nanus Pk. Leeds, W. D. Hincks, *64. Ecclesall Woods, J. M. B.

R. mannerheimi Humm. (*megacephalus* Germ.). Gill Beck, Bolton Woods, 6/20, J. W. C., *64.

Hylastinus obscurus Marsh. Galls on *Trifolium pratense* on riverside between Askrigg and Whorton, W. Falconer (*Nat.*, 1920, 29).

†*Hylastes opacus* Er. Wykeham, a few under bark, G. B. W.

Dryocætes alni Georg. Lonsdale, under bark, G. B. W., *62.

†*Miarus campanulæ* L. Sandsend, 1918, B. R. Lucas (M. L. T., *Trans. Cleveland Soc.*). This species occurs mainly in the south, but is recorded from Scotland and Carlisle.

Anaspis rufilabris Gyll. Chellow Dean, J. W. C., *63.

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Northern Zoological Notes.—Evidences of the influence of the mild season upon wild life occurs in the finding of a Partridge's nest with seven eggs near Rugby on February 12th (*Shooting Times*, 12/3/21); also a Blackbird's nest, with two young, at Alne this week (*Evening News*, 4/2/21), and in the unearthing of four young badgers, about a week old, on February 17th, on a farm at Frampton-on-Severn (*Field*, 5/3/21). In the same paper (19/3/21), a correspondent records that when fishing on the Crake, a beck running into Coniston Lake, on March 10th, he killed a 6-oz. trout, which, when knocked on the head, disgorged four elvers; a most unusual event, as the 'run' of elvers in this district is usually about mid-May or later. Two illustrations of the destructive agencies of Nature are seen in the finding last week of nine large dead salmon in the River Esk near Grosmont. Numbers of this fish have been lately found dead in various rivers (*Shooting Times*, 5/3/21). In *The Field* (12/3/21) a correspondent records that during last autumn, fishermen in the North Sea saw hundreds, if not thousands, of dead woodcock floating on the sea. A large pike weighing 23 lbs., and measuring 40½ inches long and 22½ inches in girth, was, according to *The Shooting Times* (19/3/21), recently caught by a York angler in the Derwent at Elvington. The *Yorkshire Weekly Post* (19/2/21) states that an Eagle was seen at close quarters on the flat cliffs near Filey, and was identified by a local taxidermist as undoubtedly a Golden Eagle. In connexion with the recent destruction of the White-tailed Eagle in the Peak district, it is interesting to note that it was protected on the Yorkshire side for nearly three months by Mr. E. H. Peat, a keeper in the employ of the Duke of Devonshire. In appreciation of his efforts the Royal Society for the Protection of Birds has presented to Mr. Peat, Coward's 'The Birds of the British Isles,' and a pair of field glasses. Would that we had more keepers of Mr. Peat's calibre!—R.F.

YORKSHIRE ZOOLOGY.

THE Half-yearly Meeting of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society on February 19th, and was preceded by Meetings of the Wild Bird and Egg Protection Committee, at which Mr. W. H. St. Quintin, J.P., presided; and the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee, at which Mr. C. F. Proctor presided.

On taking the chair at the Sectional Meeting, Mr. Smith paid an eloquent tribute to the work of the late President of the Union, Dr. H. Corbett, and moved that a letter expressing the sympathy of those present be forwarded to the bereaved family.

Remains of Birds and Eggs from the Peat Deposits of Holderness were exhibited by Mr. Mason. These led to an interesting discussion, and Mr. Wade thought they might be remains of the Crane. A hope was expressed that they would be sent to the Natural History Museum at South Kensington for identification.

Mr. Booth read a paper on 'The Present Status of the Black Headed Gull as a Breeding Species in Yorkshire.' The lecturer had collected together much valuable information, and called upon members to assist him to make his lists complete. Surprise was expressed at the number of Galleries in the West Riding.

Prof. Garstang gave an illustrated paper on 'Fish Scales and their Transformation.' The lecturer showed photographs of fossil fishes of the Devonian period. In these fishes rhomboidal scales covered the body and also the fins and tails. In the earliest existing fishes, such as *Polypterus*, it was clearly shown how the scales have been modified to form the fin rays. The scales are in their structure very similar to teeth. In modern fishes, though the leading fin ray is of bony structure, the other rays shew a complex composite structure which the theory that they were composed of modified scales made clear. The plates of the head had, the lecturer said, also been evolved from scales. The structure of the fin rays does not seem to be quite analogous in the case of the cartilaginous fishes. The Salmon was rather an ancient fish, as is proved by the cartilage in its head and by its air-bladder opening into the mouth.

Mr. Parkin gave an illustrated paper on 'The Twite,' and dealt with its habits as observed in the West Riding. He drew attention to the confusion that existed with regard to its Latin name. In captivity it is one of the tamest of birds and is exclusively vegetarian in its food. The cock bird has a habit of singing in the immediate vicinity of the nest, thus giving away the site; one or two hackle feathers are nearly always built into the nest. In winter it visits the lowlands when its larger tail and larger size distinguish it from the Linnet. It is very erratic in its breeding distribution, but has nested for many years in the locality described.

Mr. Fowler gave an illustrated paper entitled 'Bird Notes,' and showed photographs of various birds. The most noteworthy were some excellent photographs of a Long Eared Owl at the nest. This nest was on the ground, and the unusual site made the photograph doubly interesting. He also showed photographs of the Dunlin, Redshank, Jay, etc.

Mr. Chislett gave a beautifully illustrated paper on 'The Cormorant,' and showed photographs of nests at Great Orme's Head and also in an island in a Scottish Loch. On this island over 400 eggs were counted. Some remarkable photographs were shown of birds displaying on and near their nests. This led to an interesting discussion as to which sex displayed. The lecturer had absolute evidence that the female displayed, and as Mr. Fortune had been satisfied from what he had seen that the males displayed, it seemed evident that both sexes do so. Mr. Fortune also drew attention to the systematic way in which the Gulls raid the Cormorant's eggs, and Mr. Booth contended that this only happened when the eggs were quite fresh.—WILFRED TAYLOR.

In Memoriam.

H. H. CORBETT, 1856-1921.

FOR the first time in its history The Yorkshire Naturalists' Union has lost by death a President whose election was so recent that he had no opportunity to take up the reins of office. Less than five days of the new year had gone by when the sad intelligence was circulated that Dr. Corbett had passed away. His tall, spare, active figure and genial personality will be greatly missed, not only in the town of Doncaster, but wherever naturalists are wont to foregather.

Herbert Henry Corbett was born in 1856 at Besses o' th' Barn, and at that place, Alderley Edge, Cheadle Hulme and Levenshulme, he spent his early years under the parental roof. His father was an architect, and desired the son to follow the same profession, but, finding it uncongenial, he entered upon the study of medicine at Owen's College, Manchester. In 1888 he became M.R.C.S., and later joined the British Homœopathic Society. For a time he was resident assistant surgeon at the Convalescent Hospital, Cheadle, and, successively an assistant in the Liverpool neighbourhood, and in Bolton, from which place he came to Doncaster in 1888. He was then well known as a lepidopterist who had paid considerable attention to the usually neglected 'micros.' His first published note, written when he was in his twentieth year, is on *Geometra papilionaria*, and appeared in *The Entomologist* for 1876. He contributed numerous records to Mr. G. T. Porritt's 'Yorkshire Lepidoptera,' and also to Dr. J. W. Ellis's 'Lepidopterous Fauna of Lancashire and Cheshire.'



He was a link between the sturdy northern entomologists of the past generation and those of our day, as he had known Gregson, Cooke, Higgins, Chappell, etc., and could tell much that was interesting about them. On settling in Doncaster he quickly found his way into the literary, scientific, and philanthropic life of the town, and was soon utilising one of his numerous gifts in the cause of charity. In the severe winter of 1890-1, the frozen state of the waterways prevented the bargemen from following their employment, and, in

consequence, they and their families were in great distress. To aid the fund for their relief, Dr. Corbett gave a recital in the Mansion House. This occupied a whole evening, and was a notable feat of memory. Besides the ordinary smaller pieces, his rendering of a selection from 'The School for Scandal' was a revelation of elocutionary and dramatic power of which few had dreamed. Another phase of his remarkable mentality was his power of simultaneous, independent ambidexterity; he had besides a fine artistic sense. He also interested himself in the study of Yorkshire dialect.

In 1892 he married Jessie, the third daughter of the late S. J. Capper, of Liverpool, a distinguished entomologist, who was for many years President of the Lancashire and Cheshire Entomological Society. Their union was an ideal one. Mrs. Corbett was a help meet for her husband. Together they took their place in the various philanthropic movements of the town, ever ready to assist any cause that commended itself to them, such as, *e.g.*, The Yorkshire Institution for the Deaf and the N.S.P.C.C. Sometimes one partner, sometimes the other, appeared to take the lead, but whichever it might be, the complement would be close behind. Their home became the recognised rendezvous for naturalists, and many pleasant memories remain of the charming life passed within, which visitors have been privileged to share. The enthusiasm which they infused into the work of the Doncaster Scientific Society not only brought about an increased membership, but resulted in a steady and systematic study of the local fauna and flora. Their presence ensured the success of the rambles in the delightful district of which Doncaster is the centre. His gentle forbearing nature and his readiness to impart knowledge made him an attraction to young people who could approach him without uneasiness for help in determining their finds, while his wide knowledge and clear concise methods of exposition made him an agreeable and captivating lecturer. He filled the offices of President and Secretary for several years, and the latter office was also held for a considerable period by Mrs. Corbett. It was mainly due to Dr. Corbett's persistent advocacy that a municipal museum was established in Doncaster. Beginning with a few cases in one of the rooms of the Guild Hall, it grew until the purchase of Beechfield by the Corporation provided a suitable building for display and future extension. He was the first Curator, and as such, the initial arrangement as well as the acquisition of exhibits fell to his lot. He also took charge during the absence on war service of the present curator. His collection of local Coleoptera is deposited in the Museum.

In May, 1918, he suffered an irreparable loss in the death of his wife, which was quickly followed in October of the same

year by that of their only son, who was killed in action. Captain H. Vincent Corbett was a young man of great promise, who had done good work among the Coleoptera and Hymenoptera. These were sad blows, which made indelible marks on the Doctor's sensitive and affectionate nature, and since then his life had been bound up with that of his three daughters, to whom our hearts go out in respectful sympathy.

Dr. Corbett had not been in Doncaster very long before *The Naturalist* was furnished with the results of his investigations of his new surroundings. His first contribution occupies the opening pages of the volume for 1891, and gives 'Additions to the Yorkshire List of Lepidoptera for the Doncaster District.' These include three species new to the county. In the volume for 1893 he recorded *Lithocolletis cerasicolella* H. S., a species new to the British Fauna, in that for 1897 another addition to the Yorkshire List, and one more in that for 1902, and many others in following years, including two in 1920. Interesting varieties in his collection are figured by the late C. G. Barrett in the illustrated edition of 'The Lepidoptera of the British Islands.' These results of keen research would of themselves have been sufficient to give him a high place amongst entomologists, but his interests were by no means confined to Lepidoptera. Soon after he came to Doncaster, a note of mine, which appeared in *The Naturalist*, caused him to seek my acquaintance, and soon he began to study Coleoptera. In this order he did excellent work, as a cursory glance at the list of Yorkshire species in the Victoria County History will show. In 1906, he reported *Brosicus cephalotes* from his district, and in our last conversation he told me, amongst much more of interest, that the species is still to be found in the same locality. Another interesting find was *Carpophilus sex-pustulatus*, of which he took a specimen in Sandal Beat Wood just ten years after I had taken one in Edlington Wood. In succeeding years he met with it again, and in February, 1907, I joined him, and, together with his son, we were fortunate in finding more of this puzzling species. Reference may be made here to an article which appeared in *The Naturalist* for 1915, on 'Undesirable Insect Aliens at Doncaster.' To Lepidoptera and Coleoptera he added Hymenoptera, in great measure induced thereto by seeing specimens of *Thyreopus cribrarius* which I had taken near Wheatley Wood, and gradually he came to know most of the aculeata which occurred in his district. Besides the aculeates he did good work amongst the *Chrysidiidæ*, *Teuthredinidæ*, and *Ichneumonidæ*. In 1917 he re-discovered *Trigonalys hahni* Spin., a fossor which had not been known to occur in the British Isles for seventy years previously, and was an addition to the county list.

He also re-discovered in abundance the fine dragon fly *Libellula fulva* Müll. in its old station near Askern, from which Mr. Mosley had recorded it twenty years earlier.

The Diptera had also claimed his attention during later years. In truth his interests were too wide to be confined to a single order or even to one sub-kingdom. The volumes of *The Naturalist* and of the journals devoted to entomology furnished ample grounds for entomologists of all kinds claiming him as one of themselves. To the botanist he was a botanist, and to the geologist he was a geologist, while in the section of Vertebrate Zoology he was a welcome member. At the meetings of the Yorkshire Naturalists' Union it was often a matter of eager curiosity as to which section he would for the nonce throw in his lot. Of most of the sections he had been at one time or another Chairman, or Convener, or both. The following titles of papers, by him, published in *The Naturalist*, attest his all-round knowledge of Natural Science : ' Glacial Geology of the Neighbourhood of Doncaster,' (Parts of) Various Reports of the Yorkshire Boulder Committee, ' Neolithic Flint Implements from Doncaster,' ' Ecological Notes on two South Yorkshire Marshes,' and ' Terrestrial Mollusca at Doncaster.'

In 1919 he was elected a Fellow of the Linnean and Entomological Societies.

At the Annual Meeting of the Yorkshire Naturalists' Union held at Bradford, December 9th, 1920, he was elected President for 1921. The following letter accepting the position was read to the meeting :—

' For the past fifteen or twenty years it has been one of the dreams of my life, that if I lived long enough, I might be considered a fit occupant of the Presidential Chair of the Yorkshire Naturalists' Union. But when I look down the list of past Presidents and see such names as Foster, Williamson, Dawkins, and many others, I hardly feel that I stand in the same category ; still, if Yorkshire Naturalists think me a fairly representative member of themselves, I shall be only too proud to accept the honour they offer me.'

The choice of President gave widespread satisfaction throughout the Union, and was keenly appreciated by the doctor himself. At the time he was recuperating at Broadstairs after a severe operation. Shortly after his return I spent the afternoon of December 30th with him, and was delighted to find him so well, looking, in fact, much as usual. He expressed himself as being almost as fit as at any time in his life. He spoke with pleasurable pride on his election, and discussed with zest the excursions fixed for the year, more especially that to Wentworth, which, though com-

paratively near, was new ground to him. We ran over many topics of mutual interest, and all too soon I had to leave, little thinking that the hearty handshake and cheery good-night were the last I should have from my friend of so many years. But so it was. On the following Sunday there was a recurrence of the former trouble, necessitating another operation, from which he failed to recover, passing away early on the morning of Wednesday, January 5th, 1921.

The interment, conducted by Archdeacon Sandford, took place in Doncaster Cemetery on Saturday, the 8th January, and was largely attended, the Yorkshire Naturalists' Union being represented by Dr. T. W. Woodhead, Messrs. Thomas Sheppard, G. T. Porritt, M. H. Stiles and myself. Representatives of the other Societies with which Dr. Corbett was connected were also present. Amongst the large number of wreaths was one sent by the Yorkshire Naturalists' Union.

E. G. B.

HERBERT H. AND JESSIE CORBETT, 1892-1921.

“ These two great hearts, twin souls, who nobly played their part
Through all the many changing scenes of life ;
In every purpose one, in unity of heart,
Until their last, sad, final exit made.

* * * * *

And we who long their valued gifts have watch'd,
Know that we ne'er shall see such splendid talents match'd.
In silence mourn our loss, and bow our head,
And, for we lov'd them living, revere their mem'ry, dead.”

E. G. B.

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Waxwings at Hebden Bridge.—At High Green Wood, on Sunday, February 20th, the badly decomposed remains of a bird were noticed. I secured the head, part of a wing, several tail feathers, and the legs, and there was no doubt the remains were of a Bohemian Waxwing. Mr. H. B. Booth confirms my identification. It is many years since the last record of this species in the neighbourhood.—WALTER GREAVES Hebden Bridge.

Waxwings near Scarborough.—Several Waxwings have been reported in the Scarborough district during February. On the 9th and 10th I saw one feeding on hawthorn berries near the Mere. It was very tame and permitted a near approach. Other records are as follows :—four in Forge Valley on February 5th, seen by Mr. G. B. Walsh, B.Sc. ; five at West Ayton, and several at Thornton Dale, on various occasions.—T. N. ROBERTS.

I understand that a flock of at least thirty Waxwings frequented Thornton Dale during the whole of February.—R.F.

CORRESPONDENCE.

QUOTING REFERENCES.

In answer to your correspondent, 'X.Y.Z.,' who asks how to make a reference, I quote the following :—

'*Simia abeli*, Clark, *Asiat. Researches*, XVI., 1826, 489.'

which I have taken from a well-known book of reference on Mammalia.

The name *Simia* does not occur; the name *abeli* does not occur; the author is Abel, not Clark; the volume is XV., not XVI.; the date is 1825, not 1826; the page is correct. I need say no more.—C. DAVIES SHERBORN.

SPARROWS AND CROCUSES.

Why do Sparrows destroy yellow crocuses in the towns, and rarely in the country? I don't know whether sparrows are more mischievous in Harrogate than in other places, but here they wait until the flowers are about to open, and then nibble a cut through the leaves transversely half way down, thus spoiling the show completely. But why the yellow variety, and not the purple or white?—WALTER BAGSHAW.

There is apparently no satisfactory explanation as to why sparrows destroy yellow crocuses and leave the white ones alone. It is probable that they are influenced in the matter of selection by the brilliant colour of the blossoms, and to the fact that this first patch of colour attracts them more than it would do later when there are so many more blossoms in evidence. The nipping off of the flowers is, no doubt, pure mischief; there is a theory that they do this to obtain a little sweet matter secreted in the stalks, but I do not think there is any reliable evidence of this.—R.F.

LANCASHIRE AND CHESHIRE ENTOMOLOGY.

At a recent meeting of the Lancashire and Cheshire Entomological Society the feature of the evening was the competition for the Society's prizes specially offered for the encouragement of field work and observation. A prize of five guineas for the best series of 60 males of *Hibernia defoliaria* was awarded to Mr. Chas. P. Rimmer for his set of the moth from Delamere Forest, and Eastham Woods; the second, two guineas, was given to Mr. W. G. Clutton, of Burnley, for a collection made in the neighbourhood of that town. There were some very beautiful forms shewn, including melanic variations from Burnley. A prize of five guineas was also awarded for the best six photographs of insects in their natural resting positions, selected to shew the effect of protective resemblance, and went to Mr. Hugh Main, of London, for a very fine exhibit. These photographs were much admired, particularly the '*Bryophila perla* at rest on sandstone wall,' this being an exceptionally fine example of protective resemblance. Other exhibits were Insect Preparations under the Microscope, by Mr. Chas. P. Rimmer, and long series of early spring lepidoptera by Mr. S. Gordon Smith, the latter included some nice varieties of *Hibernia leucophearia*, *H. marginaria* and *Nyssia hispidaria*. The same member showed a fine specimen of *Acherontia atropos* captured near Chester.—WM. MANSBRIDGE, *Hon. Sec.*

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Two Boys in Beaver Land, by Major A. R. Dugmore. Hodder & Stoughton, 245 pp., 8/6 net. A narrative of Canadian wild life—well written and with a thorough knowledge of the habits of mammals, birds and fish of that colony. The chapters on beavers are particularly complete and contain much that was new to us, while the wealth of illustration makes the book doubly valuable. We don't like the black lines round each page, which give the impression that one is reading an obituary notice, or a prayer book.

NEWS FROM THE MAGAZINES.

Camping for March has an attractive new cover.

Mr. Miller Christy writes on 'A Super-abundant Sea Harvest,' in *The Selborne Magazine*, No. 345.

¶ 'The Mining, Manufacture and Uses of Barytes,' by V. Bramall, appears in *The Quarry* for March.

Mr. H. Donisthorpe gives Myrmecophilous Notes for 1920 in *The Entomologist's Record* for February.

Dr. R. F. Scharff records some young Loggerhead Turtles, recently washed up on the Irish coast, in *The Irish Naturalist* for March.

A writer in *The Journal of Conchology* states 'One day we took 270 live cockles, weighing 28 lbs., and feasted royally on them.' Apparently!

Nature, No. 2677, is largely devoted to a series of articles, by specialists, dealing with various aspects of Einstein's Principle of Relativity.

It is not often that *Nature* is caught napping, but 'Negresses and dead orang-utan' is hardly a correct description of the group represented on page 699 of No. 2674.

A reviewer in *The Museums Journal* tells of an author who conveys his knowledge 'with crystalline clarity'—we wonder if the reviewer had 'clarety' in mind.

British Ichneumonids, by C. Morley; On *Nabis lativentris*, by E. A. Butler; *Physothrips latus*, by R. S. Bagnall, occur in *The Entomologist's Monthly Magazine* for March.

Some Notes on Rearing *Erebia epiphron*, by the late J. Anderson; The Variation of *Peronea cristana*, by W. G. Sheldon; New Forest Notes and Captures, by H. P. Jones, appear in *The Entomologist* for March.

Dr. J. Ritchie writes on 'The Walrus in British Waters,' in *The Scottish Naturalist* for January-February; Capt. S. E. Brock writes on 'Bird Associations in Scotland'; and Dr. W. E. Collinge on 'The Need for a Bird Census.'

Notices of the late Charles Lcdger, a native of Hull, and a well-known Oldham naturalist; by H. H. Wareing and J. F. Robinson, appear in *The Lancashire and Cheshire Naturalist* for January. The same journal contains 'The Woodlice and other Crustacea of Derbyshire and Staffordshire,' by R. Standen.

In *Man* for March, Mr. G. A. Garfitt has a note 'On a Recent Discovery of Rock Sculptures in Derbyshire.' He describes a stone which contains what he considers to be representations of deer antler picks, etc., though we are not convinced; another stone bears seven horse-shoe curves. . . . 'This stone was given to the Sheffield Literary and Philosophical Society in 1824. It was figured by Geo. Tate, F.S.A., in his *Sculptured Rocks of Northumberland* in 1865, and by Sir J. Y. Simpson in his *Archaic Sculpturings*, in 1867. When Sheffield formed a Public Museum, this stone, with other objects, was handed over, but its label has been lost, and it has lain for 48 years, out of doors, unrecognised.' Sheffield seems to be in the limelight now-a-days.

From what we are happy to see is to be the last 'double number, Vol. XIX., Nos. 9 and 10, November and December, 1920,' we learn that 'As from the beginning of Volume XX., 1921, the subscription price of *The New Phytologist* will be raised to 25 shillings net for the annual volume of not less than 240 pages. Five issues will appear during the year, numbered 1—5, and each bearing the date of publication. The cost of each of these, supplied separately, will be 7s. 6d. net.' Among the contents of this part we notice 'Mutations and Evolution,' by W. R. Gates; 'Notes on Freshwater Algae,' by W. J. Hodgetts; 'Plant Families: a plea for International Sequence,' by A. Gundersen; 'The Evolution of Primitive Plants from the Geologist's Viewpoint,' by C. Schuchert; and 'A Hydrion Differentiation Theory of Heliotropism,' by J. Small.

NORTHERN NEWS.

The late Anne Haworth has left her residence, Hollins Hill, as a public museum, art gallery and park, as well as £28,000 for the maintenance thereof.

The Annual Report of the Manchester City Art Gallery for 1919, recently to hand, is admirably drawn up, and we have read it with great interest.

Sir Arthur Duckham writes on 'Coal as a Future Source of Oil Fuel Supply,' in *The Journal of the Institution of Petroleum Technologists* for January.

An excellent portrait of the late F. Haverfield appears in *The Journal of the Chester, etc., Archaeological and Historic Society*, N.S., Vol. XXIII., recently issued.

'A very large crystal of *galena* or *quartz*' is announced among the additions to our National Museum. Surely our authorities should know which? Perhaps it's both.

Part XXV. of S. S. Buckman's 'Type Ammonites,' has appeared, but it contains no illustrations of Yorkshire specimens among the numerous fine platts. There is also a good portrait of the author at the age of 46.

The Transactions, etc., of the Eastbourne Natural History, etc., Society, Vol. VIII., No. 29, contains abstracts of a very miscellaneous series of papers, viz., Floral Mechanism, Dew Ponds, Clay, Francis Bacon, 'Car-Bro' Printing Process, Quarries and Fish Stew! Regional Survey, and Allenby in Palestine.

The principal Trustees of the British Museum have appointed Mr. C. Tate Regan to be Keeper of Zoology, Mr. G. F. Herbert Smith to be Assistant Secretary at the Natural History Museum, and Mr. Robert L. Hobson and Mr. Reginald A. Smith to be Deputy Keepers in the Department of British and Medieval Antiquities at Bloomsbury.

We learn from *The Yorkshire Post* that an almost incalculable addition to the ore seams of the rapidly developing iron and steel district of Lincolnshire has just been discovered at Elsham, near Brigg. At considerable expense a bore was put down near the Worlaby sidings, and after many disappointments the 'Frodingham Bed' has been reached at a depth of 475 feet, and found to exist at a full thickness of 29ft. 6in.

'Implements from Plateau Brick-earth at Ipswich,' by R. A. Smith, appears in the *Proceedings of the Geologists' Association*, issued February 21st. He concludes his paper by the question 'What say the Geologists?' Speaking as one of them, and after having examined what is described as a 'Diagram of Excavations,' (on page 5) we would rather not put what we have to say in words for fear of offending the tender ears of Mr. R. A. Smith!

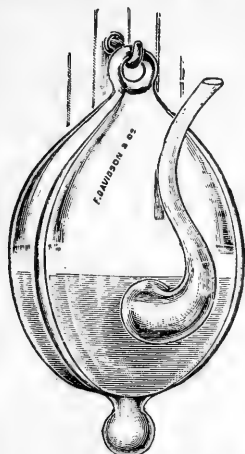
Sheffield seems to be an odd place in many ways. We learn from the press that 'The Sheffield City Council have appointed a new Chief Librarian in the person of Mr. R. J. Gordon, of Rochdale, at a commencing salary of £650.' They have also decided to give another chief librarian £52 10s., 'presumably to come here and show Mr. Gordon how to do it. The whole thing is purely fantastic. If Mr. Gordon is efficient, why bring in the other man, and if he isn't efficient, why appoint him?' We must say we agree.

In his March issue, the editor of *Discovery* entertains us. He seems annoyed that in a certain scientific treatise, 'water divining,' one of the subjects in which he is interested, is spoken of rather disrespectfully; and he again tries to champion the cause of the 'dowser.' And, after describing some card tricks, he tells us, 'To anyone who has performed such experiments as these, time after time, there can be no doubt about the existence of telepathy, and that it merits a place in the functions of the unconscious mind . . . its exact method of action is as yet veiled from us.' And so on. *Discovery* is a scientific journal, and on page 72 we read, 'Oh Lord, my God,' and so on.

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April 1st, 1921.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

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AND

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

PLANT GALLS COMMITTEE.

A FIELD EXCURSION to Roundhay and Adel will be held on SATURDAY, MAY 28th, to investigate the Cynipid Galls of the Oak, as well as any incidental Galls.

MEETING PLACE :—

Morning—Roundhay Post Office, at 10 a.m., for Roundhay Park.
(Refreshments obtainable at the Mansion.)

Afternoon—Moortown end of Street Lane, 2-30 p.m., for Adel.
(Refreshments obtainable locally.)

The two localities are within a short car ride from each other. All interested are invited.

W. P. WINTER, *Convener*,

Hurst Wood Road,
Shipley.

LETTERS to the Hon. Secretaries should be addressed to The University, Leeds.

SUBSCRIPTIONS (now over-due) to the Hon. Treasurer, E. HAWKESWORTH,
Sunny Bank, Crossgates, Leeds.

Communications for *The Naturalist*, to The Museum, Hull.

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Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Birmingham Nat. Hist. and Phil. Soc. Proc. Vol. I., part 2.
Brighton and Sussex Natural History Society Reports, 1870, 1872-3.
Burnley Lit. and Sci. Soc. Parts 8, 13, 14, 16, 17, 18, 20, 21, 23, 24, 25.
Chester Soc. Nat. Science : Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III.
Dublin Geol. Soc. Vol. I., pt. 1, 1830? ; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Garner. No. 60.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 2nd ser., Vol. VI., and Pts. 1-3 of Vol. VII (or Vol.).
Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1894.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914.—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Marine Biological Com. 1st Report.
Liverpool Geol. Association Proc. Parts 1, 3, 16.

Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

'MOORLOG.'

The Essex Naturalist recently issued, contains a paper on 'Moorlog,' a Peaty Deposit from the Dogger Bank, in the North Sea, by H. Whitehead. Further researches have shown that about forty species of flowering plants have been isolated, all of them still found in the British Isles. Bog-Bean grew profusely in great swamps with the moss *Hypnum* and common Bog-moss *Sphagnum*, the latter being the less abundant. The Common Reed flourished with other marsh plants, including Sedges. Mrs. Reid identified three species of *Carex*, *C. rostrata*, *C. flava* and *C. pulicaris*, besides Floating Sedge (*Scirpus fluitans*) and Creeping Sedge (*Eleocharis*). Associated with these came Water Plantain, Bur Reeds, *Sparganium ramosum*, *S. simplex* and the floating variety *S. natans*. Plants with more conspicuous flowers include Ragged Robin, Willow Herb, Greater Spearwort, Meadow Sweet and the Marsh Cinquefoil.

TREES IN MOORLOG.

Of trees, remains of branches, roots and fruits show the Birch to have been widely distributed; a few nuts prove the existence of Hazel, and leaf impressions indicate the Willows *Salix aurita* and *S. repens*. Numerous pollen grains of a species of Pine—probably *Pinus sylvestris*—form the only other evidence of trees. An unidentified fern was plentiful, its sporangia appearing.

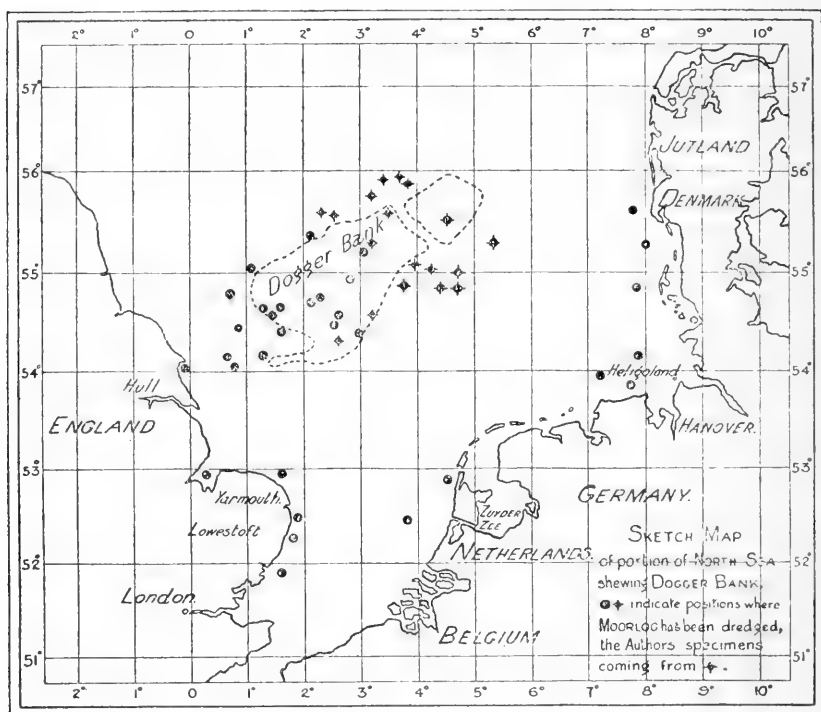
THE DOGGER BANK FLORA.

The flora of the Dogger Bank, on the whole, must have been similar to that of the fenlands of East Anglia to-day, though a comparison of the floras reveals great gaps in that of the Dogger Bank. The geological record is by no means perfect. Birch stems, fruits and roots survive, willow leaves make impressions, reeds bequeath easily recognisable rhizomes, the hard parts of the fruits—*Carex* fruits for instance—remain, but many Fenland plants, e.g., orchids, sundews and Grass of Parnassus have tiny seeds, so minute that one could hardly hope to recover them. Again, a fertile seed on germination ruptures its seed coat and so destroys the best evidence of the plant's existence. This raises a point of great interest. Why are seeds of Bog-beans so numerous, and why have so large a proportion of them the testa intact? Were large numbers of them sterile? The achenes of the Marsh Cinquefoil, on the other hand, have been split open, as if germination had taken place.

ANIMAL REMAINS.

'No bones of any kind have been found. Beetle remains occur in the form of elytra or wing cases. Mr. Champion determined nine species, chiefly common marsh insects.

I have recently picked out fifty-six specimens, and among these Mr. Blair has recognised six genera, and has been able to give specific names in five cases. The insects are all Fenland species still in existence, the commonest being *Donacia* which lives on marsh plants.' A complete list of the species of animals and plants recorded is given, as well



as a map showing the positions from which the samples have been taken ; this latter we are kindly permitted to reproduce.

THE VASCULUM.

The last two parts of *The Vasculum* are remarkably good, and contain a vast store of valuable papers and notes of local interest. It is somewhat unusual, nowadays, to find an announcement that 'the price of the Journal has been reduced.' In future three parts, comprising a volume, will appear each year. Among the numerous papers which may be mentioned are :— 'Some Sub-Alpine Gallmites,' by R. S. Bagnall and J. W. H. Harrison ; 'Distribution of British Beetles,' by H. St. J. K. Donisthorpe ; 'The Harvest Bug,' 'An Acarological Pioneer,' by [G. Johnson], and

'Some New Mites,' and 'Upper Teesdale Place-Names,' all by J. E. Hull; 'Some Notes on the Flora of Upper Teesdale,' by G. W. Temperley and R. B. Cooke; 'Lizards and Slow-worms,' etc., by G. Bolam; 'Recent Work on Isotopes,' by A. Fleck; 'Contributions towards a Knowledge of the Collembola,' by R. S. Bagnall; 'The Variation of *Primula farinosa*,' by J. W. H. Harrison.

THE GENUS 'TAENIOCAMPA.'

A meeting of the Lancashire and Cheshire Entomological Society was held at Liverpool recently. A discussion on 'The Genus *Taeniocampa*' was opened by the Rev. F. M. B. Carr, who exhibited his collection of this genus in illustration of his remarks. He also showed photographs of the ova of the different species, by Mr. A. E. Tonge, Reigate. The following members took part in the discussion and exhibited their series of the *Taeniocampidae*—Mr. S. Gordon Smith, vars. of *T. gothica*; Mr. W. A. Tyerman, *T. opima* from Wallasey, selected from a large number bred by himself. At Eccleston Mere, where nearly all the sallows grow in the water, Dr. J. Cotton had noticed that the moths which fell into the water when the bushes were shaken had no difficulty in swimming to the bank. The President described several of the best known localities for *Taeniocampidae* such as York, Hereford, Lakeside, etc., and remarked on the tendency of *T. miniosa* to cannibalism when the larvae were too closely crowded in confinement. Mr. Tait also exhibited *Asphalia diluta*, *Epunda nigra*, *Polia chi* and *Anchocelis rufina* from Lakeside and *Polia flavocincta* from S. Devon.

THE CISSBURY EARTHWORK.

The famous prehistoric earthwork at Cissbury is to become the property of the nation, and the National Trust is asking for subscriptions for its purchase, and we hope there will be a ready response to the appeal. The *Sussex Herald* for March 12th contains an article entitled 'Is Cissbury Roman?' which is correctly described as 'a startling theory.' This has evoked a reply in the issue for March 26th from 'British,' the style of which seems familiar. 'British' states:—

A REMARKABLE THEORY.

What Mr. H. S. Toms, the writer of the article in the *Herald* of March 12th, describes as a 'remarkable conclusion' is not remarkable at all. The only remarkable thing about it, in view of the fact that Mr. Toms has had practical experience in excavating prehistoric sites (so he tells us) is, that he should come to any such absurd conclusion on such slender evidence. One might just as well say that it

was put up to defend the Brighton Museum against the landing of Napoleon, because some copper coins of that period were found in an excavation there, or that it was put up to defend the Brighton Pavilion and its royal ballroom against the Kaiser during the recent war, because some remains of beer bottles were found on its site? What is the sum total of the reasons Mr. Toms has for wanting to doubt the well-considered conclusions of the greatest experts on prehistoric remains in the country, many of whom have carefully examined and excavated Cissbury—(and, presumably, Mr. Toms has not)?

OYSTER SHELLS.

The whole foundations of his two remarkable 'columns' consist of a few oyster shells, and upon such foundations any structure is likely soon to collapse. Nobody doubts that oyster shells *were* found, as reported, and it is quite possible they were of Roman date, though oyster shells were opened with the usual V-shaped notch in mediæval times, and certainly as recently as the 17th century. But Mr. Toms probably eats oysters—did *he* build Cissbury? He might just as well claim to be the architect, as try to tell us that the Romans built it. As anyone who has the most elementary knowledge of Roman remains knows, those early Italian invaders had a very definite plan of carrying out their defensive work. Why did they depart from it at Cissbury? To please Mr. Toms? And in no period of our history more than in Roman times were coins, pottery, objects in iron, bronze, bone, earthenware, glass and other materials thrown about so lavishly and left in the soil, greatly to the benefit of subsequent occupiers of their sites. Why are there no such crowds of relics at Cissbury? Instead, did the Romans collect the thousands and thousands of prehistoric flint implements, as well as the thousands and thousands of flint flakes and 'wasters,' merely to confuse future historians and prove they are all wrong and that Mr. Toms is right? It reminds one of the story of the dear old lady who was watching the soldiers march by. 'Look,' said she, 'they are all out of step but our Tom.'

GEOLOGY OF MESOPOTAMIA.

Among the useful compilations prepared for Army use during the war, one has now been issued to the public. The 'Geology of Mesopotamia and its borderlands,' compiled by the geographical section of the Naval Intelligence Division, Naval Staff, Admiralty, Paper 'I.D. 1177,' price five shillings net (Stationery Office), dates from March, 1921, has 116 pp. 8vo., four maps and ten sections. It deals with the geology of Mesopotamia, Persian Gulf, parts of Persia, Arabia and Armenia, with their economic minerals, oil-fields, and soils.

Confessedly a mere compilation, it is well done and most useful, for it includes a bibliography and a good index. The various systems are clearly set out, and sufficient fossils are enumerated to stamp their horizon, and the various writers quoted are summarized in a business-like manner. It is a pity that a few names like Eridu, Ur and Elam were not introduced into the map of the Euphrates-Tigris Delta, as they would have greatly increased its value from the archæological side when comparing the two lines of coast in the times of Sennacherib and Nearchus.

SCIENCE IN 1853 AND 1921.

At a recent meeting of the Hull Scientific and Field Naturalists' Club, a lecture was given by Mr. T. Sheppard on local science and the visit of the British Association next year to Hull. The object of the address was to compare the state of science in Hull and district in 1853 with that which obtains to-day. In 1853 the British Association for the Advancement of Science paid its one and only visit to Hull, although during the same period every town and city of importance in the United Kingdom has been favoured by visits on two, three, or more occasions. As the Association only visits places from which invitations have been received, the reason of its apparent neglect of Hull is obvious, and now that at last definite arrangements have been made for it to visit Hull in 1922, an opportunity arises to review the state of things to-day with what existed seventy years ago.

THE REPORT.

The report of the Hull 1853 meeting is an interesting document, and consists of 350 pages. Among the papers which were then read and discussed are several having an important bearing upon the natural history, physical features, and trade of the district; practically every one of which is written in ordinary English language, and can be understood by anybody. In addition, the following papers were printed in extenso:—‘The Physical Features of the Humber,’ by James Oldham (one of the most complete contributions to this subject ever written); ‘On the Rise, Progress, and Present Position of Steam Navigation in Hull,’ by the same writer (which is interesting in comparison with the conditions which exist to-day). Dr. Bell gave ‘Observations on the Character and Measurements of the Degradation of the Holderness Coast.’ These and numerous other similar communications indicate the extremely popular and important but, nevertheless, thoroughly scientific character of the deliberations.

A TOWER OF BABEL.

In those days the meetings were held in the rooms of the

Literary and Philosophical Society, and the members attended them all. As a contrast, we have the state of things to-day, when, beyond the presidential address and one or two meetings at most (and of course social gatherings), the members do not get an opportunity of conversing with each other, but are divided into twelve or more sections, each of which is of such a specialised nature that it is almost hopeless, excepting in rare instances, for anyone but a specialist in a particular section to understand what is going on. The advancement of science is such that its annual conference is almost transformed into a veritable 'Tower of Babel,' where there is much confusion of tongues. From recent discussions in the scientific and general press it seems clear that, without minimising the value of special work, the time has arrived when more attention should be devoted to popularising science, and at the Hull meeting strong efforts should be made to see that the artisans and students have every possible facility for hearing and benefitting from the remarks of the leaders of scientific thought who will then be assembled in the city. The various committees which have the arrangements in hand for the Hull meeting will have this aspect of the meetings constantly before them.

A YORKSHIRE ARCHÆOLOGIST.

Under the will of the late W. T. Lancaster, of Leeds, who died in November last, the Yorkshire Archæological Society will eventually benefit considerably. The will was proved for £23,447. The testator leaves an immediate legacy of £200, his copy of 'Dugdale's Baronage,' and all his manuscripts or personal literary productions—of which there were many—to the Yorkshire Archæological Society, in whose work he took an especially keen interest. He published privately, at his own expense, 'The Chartulary of Fountains Abbey,' in two volumes, another of his productions being 'The Chartulary of Bridlington Priory'; he wrote or edited works on Kirkstall Abbey, Arthington, Adel, and Horsforth, as well as 'Letters addressed to Thoresby,' and at the time of his death there was in the press an article on Birstall and Oakwell, and the Batt family. The sum of £200 is also bequeathed to the Thoresby Society, and there are a few legacies to relatives and personal friends. The life interest of the residue is left to a relative, and when this falls in, the whole of this amount—roughly about £20,000—will go to the Yorkshire Archæological Society.

—: o :—

Mr. F. W. Frohawk, in *Country Life* of March 12th, 1921 (p. 314), states that a fine adult male Pine Marten was captured in Cumberland on November 22nd, 1919. Its total length was 23 inches.—H. B. B.

NESTING STATUS OF THE BLACK-HEADED GULL IN YORKSHIRE.*

H. B. BOOTH, F.Z.S., M.B.O.U.

IN 1881, when Messrs. Clarke and Roebuck published their then excellent 'Handbook of the Vertebrate Fauna of Yorkshire,' there was but one breeding station of the Black-headed Gull in the West Riding, viz., the large gullery on the Yorkshire portion of Thorne Waste, in the extreme South-west. In fact it might be said to have then been the only breeding station in Yorkshire, as the Riccall Colony was extinct, and as a boy at school in York at that time, I well remember the great eagerness there was to obtain the eggs of the few pairs of Black-headed Gulls that were still hanging about Strensall Common, on the site of the former large gullery. But during the last twenty years a very different state has existed, particularly in the West Riding, where numerous breeding stations have sprung up; although they are little known outside the county. Unfortunately, perhaps, 'The Birds of Yorkshire,' did not particularly refer to the change that was then taking place. From about the year 1894 to a little into the twentieth century, bird-lovers, in the Yorkshire dales, were puzzled and baffled by the increasing numbers of adult Black-headed Gulls appearing year by year, which spent most of their time at the numerous sewage beds which had been laid down; particularly in Airedale. Many reports of their nesting were investigated, but for the first few years all proved to be incorrect; but later it became known that several nesting stations had been established. These mostly have increased, both in the numbers of the birds, and in the number of the breeding sites, although some, such as those at Fly Flat and Keighley Moor Dam, always appear to have small struggling colonies. In our opinion the birds that were forming these new breeding stations were coming from the west, and chiefly from the huge gullery at Cockerham Moss, about sixteen miles south of Lancaster, which has been extinct for about a dozen years now. There were not any bird-marking schemes in those days, or we might have had more precise information. However, I have included particulars of 'ringed' birds that have occurred in later years, and they all point to a migration from more western breeding stations.

More investigations at the various nesting stations should be undertaken, and a full, and as correct a list as possible, be made for the county for future reference and comparison.

* Read at the meeting of the Vertebrate Section of the Yorkshire Naturalists' Union, held at Leeds on February 19th, 1921, and revised.

Of course there will always be fluctuations, but they may not be so great as they were during the leanest years of the war, when large numbers of these gulls' eggs were collected for human food, with the consent of the Law. Their eggs are protected again now, and it may be necessary for our Wild Birds' and Eggs' Protection Acts Committee to move where a gullery is being raided. The bird is one of the most useful birds to the agriculturist, and is also a good scavenger.

In the West Riding, at least, the Black-headed Gull is practically a migrant, arriving from early in March, and the last departing early in October. It is not often seen here in winter, excepting in very wild or hard weather.

I beg to tender my best thanks to all who have supplied me with information. One of my greatest difficulties has been that in several cases the same gullery has been described under two or more geographical names.

WEST RIDING.

Thorne Waste.—Mr. E. W. Wade informs me that about ten or twelve pairs still nest annually on the Warp on Thorne Waste, close to the site of the old gullery there.

Black Moss, near Diggle, and Marsden Moors, etc.—I have found the utmost difficulty in dealing with this nesting station, or rather, as it is now, this series of nesting sites. The gulls arrived and nested for the first time at Black Moss about the year 1895 or 1896. For several years they confined their attention, so far as nesting was concerned, to Black Moss. But for many years now (probably over a dozen) they have been so harried and persecuted, and later fired at by the gamekeepers, that they have become very wild, and have nested in many places. Some of these sites are made use of each year and others are not. In 1920 the keepers gave the gulls such a hot reception on their return, that none nested on Black Moss that season. In 1913 Mr. Fred Taylor, of Rochdale, counted 110 nests with eggs, and estimated the numbers at Black Moss for each year, from 1913 to 1919 inclusive, at about 150 pairs, and one of the gamekeepers estimated the number of pairs on and around the Marsden Moors (including Black Moss) as over 200 pairs in 1919. In addition there were a few outlying nesting sites. Capt. A. W. Boyd informs me that the ringed gull reported in *British Birds* (Vol. VIII., p. 214) as from Stanedge Moor gullery was really from Black Moss, as he was with the man when he picked it up. This bird was evidently nesting, and had been 'ringed' at Ravenglass four years and one month previously. A nestling, 'ringed' by Capt. Boyd near Diggle, on July 2nd, 1914, was reported in *The Shooting Times* from near Goloucester, in January, 1916.

I must particularly tender my thanks to Messrs. Fred Taylor and Johnson Wilkinson, and to Capt. A. W. Boyd, M.C., for helping me to deal with this somewhat difficult nesting station.

White Holme Reservoir, Blackstone Edge (just within the county).—Probably this gullery was established about twenty years ago, and it still exists.

Writing in *The Halifax Naturalist* for August, 1902 (Vol. VII., pp. 53-4), Mr. Harold Pickles says as he approached White Holme reservoir, 'Black-headed Gulls appeared in numbers. By the time I reached the breeding station the whole colony of over two hundred were screaming overhead. Breeding was over, and the nests only contained a few addled eggs.' Although I am thankful to Mr. Pickles for an early record of this colony, I am afraid his description of the young birds will not hold good. He says 'The young birds can now only be distinguished from the old ones by their *lighter colour and cleaner appearance*.' Taking the 200 old and young birds, a conservative estimate is that thirty to forty pairs nested at White Holme in 1902. There is always a natural tendency with people not used to gulleries to over-estimate the number of birds present.

This colony appears to have fluctuated in numbers, and has considerably varied the nesting sites locally, but always near White Holme reservoir, or on Soyland Moor near by. Mr. Fred Taylor first visited this station in 1906, when there appeared to be only about twelve nests. The following year he found a great increase, and estimated the numbers at about 150 pairs, nesting in three separate places. They have fluctuated considerably since. In 1917 the bulk of the birds moved to that part of Soyland Moor (near by) that is bounded by the Halifax and Mytholmroyd roads. They had a sorry time there that year, and Mr. Taylor does not think a single chick got off from this site. One Sunday in May he saw several men taking eggs (for human food during the war), and after counting the eggs each man had, he found they totalled over 300 eggs in all.

On June 22nd, 1919, Capt. Boyd, M.C., found about 40 nests containing about 70 eggs on the reservoir site. Mr. F. Taylor considers that the numbers of birds present in 1920 were considerably fewer than for several years. Mr. Walter Greaves has visited this station from time to time, and says the numbers are subject to considerable fluctuation.

Mr. F. Taylor informs me of a small outlying station at a reservoir below Ringstone Edge, which was reduced to about ten pairs in 1920.

Fairburn, near Castleford.—I have to thank Mr. H. Pollard for information about this gullery, and for obtaining particulars from the gamekeeper (Joseph Fox) there. The

birds first came in 1910, about 50 or 60 of them, and stayed the summer. In 1911 they came in much larger numbers. In 1912 there were still more gulls. 'Until now I had never looked for eggs, but in the spring of 1912 I got a boat and found large numbers of eggs on the islands.' The birds increased in numbers in 1913 and 1914. In 1914 he estimated that they would exceed 1000 pairs. 'In 1915 they were only here in small quantities, and I was told the reason was, that the large quantities in the previous years had eaten up all their natural food in this district, and that they had gone to nest elsewhere where the food was more plentiful.' 'They increased in numbers each year in 1916, 1917, and in 1918, when they again got to a great number, but not so many as in 1914.' 'In 1919 and 1920 the numbers again decreased, probably owing to the shortage of nesting ground, as almost all of the islands have been washed away with the floods, leaving it almost one clear sheet of water. In 1920 there would be probably about 150 pairs nesting here.'

The inverted commas include extracts from Mr. Fox's excellent description of this colony.

Fly Flat Reservoir (Halifax Waterworks).—Cock Hill Moor, near Denholme. This was the first nesting colony of Black-headed Gulls I ever saw in the West Riding, I think in the year 1900 or 1901—when there would be about 25 to 30 pairs present. A note in *The Halifax Naturalist* (Vol. IV., page 58, Aug., 1899), written anonymously, implies this colony must have been founded about 25 years ago. The notes cannot refer to any other colony than that at Fly Flat; but to make certain I quote them in full. 'Though known to but few people, there is an undoubted, though small, gullery in an unfrequented part of the parish, where the gulls (*Larus rudibundus*) have been breeding for the last few years in varying numbers. Last year they were estimated to be forty pairs, and about half-a-dozen nests have been seen this spring.'

I have visited this colony two or three times since, but never later than 1910, and the birds present have varied from about twenty to fifty pairs. Mr. Walter Greaves, who has visited the colony several times during later years, confirms this estimate, and adds 'there were usually very few nests.' Yet a very good field observer estimated the number as about 100 pairs in 1918. No doubt the numbers fluctuate from year to year. Mr. H. Waterworth informs me that there were more than twenty nests in 1919 and 1920.

A marked bird in this gullery, on June 5th, 1915, and reported by Mr. W. Greaves, had been ringed as a nestling at Delamere Forest, Cheshire, on June 9th, 1913 (*British Birds*, Vol. IX., page 271). Another bird found dead in the breeding season three years after it had been ringed at Llyn Mynyddlod,

near Lake Bala, Merionethshire, is reported from 'the Hebden Bridge Gullery' (*British Birds*, Vol. VIII., page 217), and is no doubt referable to this breeding station.

Keighley Moor Dam.—From information received, and from what I can remember, the Black-headed gulls first nested here in 1902 or 1903. Their eggs have often been raided, it has never been a thriving colony, and has decreased rather than increased. Mr. F. H. Edmondson estimates the numbers during the last half-dozen years as between ten and twenty pairs. Relating to this nesting station, Mr. H. B. Muff wrote in *The Naturalist* (1900, p. 304): 'On 27th July last (1900) I noticed about a dozen Black-headed gulls here, and amongst the rushes at the west end of the reservoir I found a young bird unfledged. I do not know of any record of the species breeding in that locality.'

The above appears to have been an exceptional incident, as the gulls were not there the following season. July 27th is certainly an exceptionally late date for a Black-headed Gull to be unfledged.

Upper Barden Reservoir, Barden Moor, Upper Wharfedale.—The Duke of Devonshire's gamekeeper (Stephen Birch) informs me that although there were several Black-headed Gulls about for a year or two before 1900, he never found any nests or eggs before that year. After that they increased very rapidly for about twelve years. In 1912 and 1913 he estimated their numbers roughly at about 150 pairs. Afterwards they decreased year by year, owing, as Mr. Birch thinks, to being disturbed by people taking their eggs. Mr. Rowan (*The Naturalist*, 1920, page 153) estimated the number nesting in 1918 as between 40 and 50 pairs. It is rather a significant fact that in the great 'caterpillar year' of 1917 the gulls failed to put in any appearance at this colony (*The Naturalist*, 1920, page 153) whilst higher up the same valley and in the heart of the caterpillar country, it was the record year of the Oughtershaw colony!

At this colony the gulls nest in a swamp close to the Upper Badern Reservoir, or High Dock as it is known locally. In late years a small offshoot from this colony has been established at the small Lodge at the top of Gill Beck, and close to Barden Fell. Mr. Birch estimated that about six pairs nested there in 1920, and presumed their eggs would be taken by passers by.

(Grassington Moor, Upper Wharfedale.—This nesting colony has been extinct for about ten years. It ceased with the draining off of the water from Priest Tarn for lead-working purposes, although on one occasion since a few pairs of Black-headed Gulls endeavoured to nest on some flood-water there. This has never been a thriving colony, and I should say it

was established in 1900 or 1901, and has varied between a dozen and thirty pairs during its existence).

Oughtershaw in Langstrathdale.—A nesting colony, about two miles from the village, was established about 25 years since, and gradually increased, until a few years ago quite 150 pairs nested there. But after the great 'caterpillar year' (1917) they have decreased, and during the last three years 30 or 40 pairs only have nested. (Geo. Turnbull).

Keaden, near Clapham railway station.—This colony started with two pairs about 20 years ago, and has continuously increased. It is in two portions, the larger colony now being on Dovenanter Moor, which I carefully estimated in 1920 to consist of not fewer than 300 pairs. The second colony lies about three-quarters of a mile in an easterly direction from the first one, and in 1920 would contain about 80 or 90 pairs. The gamekeeper (T. Brennand) informs me that up to 1914 this second colony was the larger, but the birds have steadily moved to the one on Dovenanter Moor. He considers that, taking the two colonies together, they have considerably more than doubled during the last eight years. Some years several pairs nest at another place in the direction of Bowland Knotts, but it was not occupied in 1920.

Browsholme Tarn, in Bowland.—In 'The Birds of Yorkshire,' it is stated 'several pairs are established' (page 673). The gamekeeper on the Browsholme estate does not remember them, and he has held the post for over 28 years. He informs me that the gulls first came and nested about 1915. They increased until 1918 when there were more than twenty nests. These were robbed, and the birds decreased, only about five pairs nesting in 1920.

About two miles away, at Gagglemire, on Newton Fell, a few pairs of Black-headed Gulls also came and nested about 1915. These have since returned annually, but there were only about five pairs in 1920. It was evidently on this site that Dr. W. Eagle Clarke ('Vertebrate Fauna of Yorkshire,' page 82), recorded that 'in 1860 a colony appeared, deposited a large number of eggs, but these being all taken, the gulls left the place and never returned.'

In the extreme N.W. of the county several small gulleries have been attempted, chiefly in the neighbourhood of Sedburgh and Dent, and also at Semer Water, but so far as I can learn these were only of a temporary nature, and have only been occupied for a year or so.

NORTH RIDING.

Foul Syke Mere, Fylingdales Moor, about three miles from Robin Hood's Bay.—This is the gullery mentioned in 'The Birds of Yorkshire' as on the moors between Whitby and Scarborough, to have originated about 1893, and in 1902

to have consisted of about twenty pairs of nesting birds. Mr. W. J. Clarke informs me that this nesting colony has varied very considerably in numbers. The eggs of the birds are much harried, partly by Herring Gulls that fly over from the cliffs, but more by boys, and by a collector who visits this gullery each season and takes all the eggs that he can lay his hands upon. Mr. F. Snowden, of Whitby, has also sent me many valuable field notes. He informs me that on the same moor, about a mile away, there is another breeding station, where, at any rate, since 1908, about 20 pairs have nested. In the following table I give the field notes of each observer under their initials.

1905. First visit, and saw about a dozen birds and only two nests. (F.S.)

1906. About 40 to 50 pairs were there, and early in May every egg was taken by a certain collector. On May 27th several birds were again sitting. (W.J.C.)

1910. About 150 pairs were nesting there. (W.J.C.)

1911. May 29th, visited the mere and found a large number of birds, but I did not disturb them as they appeared to be sitting. (F.S.)

1912. May 30th, saw about 80 birds, many nests, all with full clutches. (F.S.)

1913. April 23rd, estimated the birds at about 150. Rather early for nests. (F.S.)

1915. May 23rd, counted over 100 nests in the rushes surrounding the mere. We did not go on the islands, where there were many other nests. On June 6th large numbers of young birds and many eggs unhatched. (F.S.)

1916. May 17th, saw a large number of nests; the birds were laying. (F.S.)

1917. A friend paid two visits and saw about 100 birds. He also saw evidence that the eggs were being regularly collected. (F.S.)

1918. May 18th, found the larger number of birds at the second breeding station. But a great decline in numbers. (F.S.)

1919. May 3rd, only 30 birds. No eggs or nests. (F.S.)

1920. My friend was at Foul Syke several times, and he never saw more than about half-a-dozen birds. I was there once and did not see more than odd birds. (F.S.)

1920. Mr. Arthur Wallis visited the place, and tells me that only six or seven, pairs of birds were nesting. (W.J.C.)

It would appear that in 1915-6 this colony reached its most prosperous stage. Mr. Snowden informs me that in 1917 and after, the eggs appear to have been taken on a wholesale scale, and the numbers nesting there have rapidly declined. This systematic collecting of every egg might have been permissible during the war, but should it continue, I suggest it

would be a suitable case for our Wild Birds' and Eggs' Protection Acts Committee to take up.

Locker Tarn, in Wensleydale.—This colony is mentioned in 'The Birds of Yorkshire' as having been founded about 1888, when a single pair of birds nested. It increased until in 1902 it was composed of about 40 or 50 pairs. I have not been able to get any recent information about this nesting colony. Mr. R. Fortune visited it six years ago, when there were about 15 pairs of birds.

On the moors, in the north of the North Riding, there are several isolated sites where, at times, a few pairs of Black-headed Gulls have nested, and where possibly a permanent nesting colony may be established. Prominent amongst these, as Mr. Snowden suggests, is a site nearer Three Houses, on Egton High Moor, and another at Wintergill, on Glaisdale Moor. He also informs me that there was a thriving nesting colony at North Dale, near Rosedale, until it was drained for mining operations. A bird 'ringed' at Egton was found seven months later in the Azores (*British Birds*, Vol. VIII., p. 217).

EAST RIDING.

Skipwith Common.—This is the largest gullery still existing in Yorkshire. On April 28th, 1917, I went to Skipwith with Mr. F. H. Edmondson in order to make arrangements for the eggs to be collected and sold at a low price to assist the food supply during the submarine menace. From a note made at the time, I find that the gamekeeper (J. Morris) informed us that there was a decrease in the numbers, and that he estimated them to be between 400 and 500 pairs, as against about 800 pairs in 1916. In 1918 there was again a considerable decrease, which Morris could only account for by the numbers of searchlights about, so after a preliminary round of 471 eggs we decided to discontinue for that year.

In 1919 Morris estimated the number nesting at about 700 pairs. Last season (1920) was a record. Morris had never seen so many gulls there previously, and after a careful estimate, he calculated there were between 1200 and 1300 pairs nesting at Skipwith in the season of 1920! So this gullery cannot be said to have suffered by the eggs that were taken for human food during two years of the war. Morris is a careful and capable estimator of numbers. He calculates them chiefly by the area of ground occupied by their nests—which is the only reliable method in a large gullery.

Bubwith Ings, near North Duffield.—In 1920 about 20 pairs of Black-headed Gulls nested here, although I believe many of the nests were drowned out by the floods. It remains to be seen if it will be chosen as a regular nesting site. It is, no doubt, an outcrop of the now crowded colony on Skipwith Common, and lies two-and-a-half miles south-east from it.

WHY IS BOREUS A WINTER INSECT?

CHRIS. A. CHEETHAM.

THIS question was suggested on finding *Boreus* last November* and by seeing springtails in plenty on the snow the same month. A possible reply suggested that its food requirements were available at such times, and it seemed desirable to investigate the fauna of the mosses from the limestone walls where *Boreus* occurred.

For this purpose some large patches were gathered, shaken and sifted with surprising results to a novice at such work. Springtails were in plenty, and seemed to offer the most likely answer to the query. Mr. J. M. Brown kindly examined the collection, and states that the following were included:—

Isotoma sensibilis Tullb., 3 specimens.

I. viridis Bourl., many.

Tomocerus vulgaris Tullb., about 12.

Entomobrya nicoleti Lubbl., 1 specimen.

Orchesella cincta Linn., many.

O. cincta var. *vaga* Linn., several.

He says that these are *not* specially 'winter forms.'

The Pseudoscorpions, Spiders and Mites were named by Mr. W. Falconer, with a similar result as to winter restricted forms. His list includes:—

PSEUDOSCORPION.

Obisium muscorum. Both sexes and all ages, some being unusually dark. He queries this as perhaps due to the sun's heat, together with open habitat and elevation.

SPIDERS.

Cryphoeca silvicola, ♀, ♂.

Amaurobious fenestralis, 1 immature ♀.

Oonops pulcher, ♀, ♂.

Oxyptila trux Bl., ♂, imm.

Diplocephalus fuscipes Bl., ♂.

Panamomops bicuspis, ♂. No other Yorks. records west of Collingham.

Lophocarenum nemorale, ♂, ♀. New to V.C. 64.

HARVESTMAN.

Megabunus insignis Mde., ♀.

MITES.

Damaeus clavipes, ♀ (*Oribatidae*).

Gamasus crassipes, ♀, ♂ (*Gamasidae*).

Pergamasus runciger, ♀ (*Gamasidae*).

Cyrtolaelaps kochii, ♀, (*Gamasidae*).

Bdella vulgaris Herm., ♀ (*Thrombiidae*).

Eothrombium echinatum, ♀ (*Thrombiidae*).

* See *The Naturalist*, 1921, p. 16. W. J. Fordham points out that it was previously recorded for the county by J. W. H. Harrison, in *The Vasculum*, 1915, p. 57.

Mr. W. J. Fordham identified the following beetles .—

Loricera pilicornis.

Othius myrmecophilus.

Tachyporus chrysomelinus.

T. humerosus.

Tychus niger.

Atomaria apicalis.

Atheta spp.

Mr. F. Rhodes puts the woodlice down as—

Porcellio scaber.

Trichoniscus pusillus.

There were a few minute hymenoptera which it has not been possible to get identified yet, and three small diptera—

Lonchoptera lutea Panz.

Limosina spp.

This completes the collection. The presence of peculiar winter types is not proved, however, and although it is possible that the particular state of development might make some a suitable food supply,* still it appears that similar food is available the year round, and some other reason must be sought. Is it possibly the absence of some enemy to whom *Boreus* would be a food supply? In such a case the absence in winter of insect-eating birds from these open uplands and moors would certainly seem a good reason for the appearance in winter and absence in summer of an easily caught insect like *Boreus*.

The only other suggestion seems to be that in the larval state *Boreus* requires summer conditions; but this is somewhat unusual.

I am much indebted to the gentlemen named for their kind assistance, and hope that this mid-winter fauna of an extremely small area may prove of interest to any engaged in Insect Ecology.

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Gagea at 1125 ft. altitude.—At Colt Park Wood, near Ribbleshead, in March last, Messrs. Burrell, Pearsall, and the writer saw this plant in fair quantity over an area of many square yards, no flowers were seen, but the leaves are definitely identified by the 3-5 strong ribs on the back (even in Bolton Woods the percentage of flowering plants is very low, certainly less than 5 per cent.). Mr. A. Bennett, of Croydon, to whom leaves were submitted, states that the highest altitude he has it recorded at in this country is 750 ft., though in Norway and Finland it grows at 650 metres.—CHRIS. A. CHEETHAM.

* There may be larvae which were not seen, and possibly other species in addition to those in the list given.

THE CONGLOMERATES UNDERLYING THE CARBONIFEROUS LIMESTONE IN THE N.W. OF ENGLAND.

J. A. BUTTERFIELD, M.SC., F.G.S.

(Continued from page 8).

The following comparison of sections is given to make the relationship clearer. Where a gap is left the exposure is obscured :—

<i>Micklegill Beck.</i>	<i>Chapel Beck.</i>	
Dun coloured limestone.....	Dun coloured limestone ...	} Total thickness about 220 feet.
Dark brown mudstone.....	Dark brown mudstone	
Light green conglomerate...	.....
Bluish green shale	Bluish green shale	
Yellowish green sandstone pebbly in places.....	Light yellowish sandstones, grits, etc., with inter- bedded black shale	
Red sandstone	Red flaky sandstone.....	} Thickness variable.
Red conglomerate	Red sandstone	
Red sandstone.....	Red conglomerate.....	
	Red sandstone	

From the close similarity of the two sections and the perfect agreement in dips of the different beds, the passage from the red series in these becks into the green series and onwards into the limestone appears to be a perfectly conformable one.

(2)—BIRK BECK, STAKELEY BECK, ETC.

In this area the exposures are interesting, but the interpretation of the field evidence is difficult and the present interpretation is merely a temporary working suggestion. It is quite possible that it may require alteration as more field work is done.

(a) *Birk Beck*. Commencing at the village of Greenholme, about a mile north-west of Tebay, and going up Birk Beck, a tributary of the Lune, joining the latter at Tebay, the following series of beds is passed over. First of all, just where the small stream, Eskew Beck, joins Birk Beck at Greenholme, and also in the bed of Birk Beck itself above the village, the Silurian rocks are well exposed, dipping very steeply; and 300 yards above the village in Birk Beck the junction between these Silurian rocks and the overlying conglomerates is displayed. Downstream the old rocks can be seen dipping quite steeply, and on the eastern bank of the stream, overlying these older rocks, is an exposure of red conglomerate fairly coarse in texture, pebbles 4 in. to 5 in. across forming a small cliff about 15 feet high, but giving little indication of dip. These red conglomerates form the bed of

the stream for about 300 yards, when they are overlain by green conglomerate dipping 7° N. 30° E. The pebbles which make up this conglomerate are of a green shaly sandstone, nearly always flat with rounded edges, not very hard and on the average about the size of a penny. Quartz pebbles are also present and a few interstratified sandy layers. This conglomerate is altogether different from the green conglomerates mentioned in Micklegill Beck and Chapel Beck above. It neither contains the variety of pebbles that they do, nor are its pebbles of the same shape or as compact. As it appears to be wholly composed of pebbles of the same kind of material it would seem to be of very local derivation. This green conglomerate forms the bed of the stream up to and about 600 yards above Beckside, when it is overlain by light greenish sandstones and a light coloured sandstone containing curious black spots. The dip here was noted as 10° N.E. A short distance higher up, and about 400 yards below Scoutgreen, these sandstones are again overlain by red sandstones, well exposed a little higher up in the sides of the stream and dipping 8° N. 20° E. Above Scoutgreen these red sandstones give place to some lighter coloured and purplish shaly sandstones which are well exposed in the bank opposite Scoutgreen, and which were distinct from and underlying the red sandstones just mentioned. These continue for some distance up Birk Beck. So far as the exposures in Birk Beck seem to suggest three distinct sets of deposits—a red conglomerate, overlain by a series of green sandstones and conglomerate, again overlain by red sandstones, the latter agreeing with those on the lower portions of Micklegill Beck, Blind Beck and the Lune.

Fortunately several becks, giving sections, flow into Birk Beck from the west, and these throw some light on the distribution of deposits in this area. The most important is *Stakeley Beck*, entering Birk Beck 300 yards above Scoutgreen. At the bottom of this, and in the bed of the stream, the green conglomerate occurring in Birk Beck is exposed, and is directly overlain by red to purple shaly micaceous sandstones forming the sides of the stream. These sandstones contain occasional green shale pebbles from the underlying green conglomerate. Higher up Stakeley Beck a series of red sandstones and conglomerates comes in, and 500 yards from its junction with Birk Beck the Silurian rocks are exposed, making a gorge in the stream.

The small stream, *Hollin Gill*, which flows into Stakeley Beck, gives some useful information. At the very bottom of the beck red shale and conglomerate is exposed, but a short way upstream is green conglomerate similar to that in Birk Beck, and enclosing a few sandy bands. This continues for about 500 yards upstream, when it gives place to a fairly coarse

red conglomerate, and just at this point the red conglomerate contains a large amount of calcite cementing material, which, together with other evidence, points to a faulted junction. This red conglomerate with a few shaly bands continues upstream, and is exactly similar to that in Stakeley Beck. For a short distance the Silurian rock is exposed in the stream, and then a small isolated patch of red conglomerate is exposed, filling in a hollow as shown in the sketch-map. The green conglomerate of this beck overlies the red conglomerate and shales at the bottom, and is probably faulted from the red conglomerate at the top.

Further south, near to the farm Owletbank, the stream, which is a tributary of Eskew Beck, gives good exposures of green conglomerate. The conglomerate here is practically the same as that in Birk Beck with similar flat pebbles of green shaly material, if anything a little coarser than that exposed at Beckside. It forms the bed of the stream throughout the exposure, and so far as it is possible to take the dip it dips lightly in a northerly direction.

Between Hollin Gill and the latter beck there are two very small becks, each giving exposures of this green conglomerate. In the one next to Hollin Gill the exposure occurs just where it is crossed by the 700 foot contour on the six-inch map, and in the one south of this the conglomerate is exposed in the gully marked out by the same contour. Evidently, therefore, this green conglomerate stretches from Hollin Gill and Stakeley Beck as far south as Owletbank.

Such is the evidence obtained by a survey of these becks, and the sketch-map gives the writer's interpretation of the probable arrangement of the deposits here. It will be seen that the beds noted above have been divided into three groups as follows :—

3. Red sandstones.
2. { Purplish green and light coloured shaly sandstones.
Light coloured and greenish sandstones.
Green conglomerate.
1. Red conglomerate, shales and sandstone.

The red sandstones, (3) above, are those exposed in Birk Beck just below Scoutgreen, and they are taken to be the same as those displayed in the lower portion of Micklegill Beck, Chapel Beck, Blind Beck, the Lune, and the becks to the east, described in the next section. It was decided that these overlie the green series marked (2) above, unconformably, as shown on map, and that these latter deposits, viz., the purple and green shaly sandstones, light coloured sandstones and green conglomerates themselves form a small series which overlie the red shales, sandstones and conglomerates of

Stakeley Beck, Hollin Gill and Birk Beck, unconformably. According to this interpretation there are three distinct sets of beds, all unconformable to each other, though the unconformity is on a very small scale and what one would expect in these deposits. It is easy to imagine that after the lower red conglomerates and sandstones had been laid down, there was a local deposition of this green series, perhaps very limited in extent, and then, either with or without subsequent erosion, a resumption of the deposition of the red conglomerates and sandstones, leaving this green series as a lenticular mass included in the red series. This, of course, is purely and simply a theory, but if it is true, this is a most interesting area.

The small isolated patch of conglomerate at the top of Hollin Gill is interesting in showing the manner in which the conglomerate has filled in the small inequalities in the old Silurian floor.

(To be continued).

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The Microscope Shown to the Children. By E. Hawks. T. Nelson & Sons, 154 pp., 4s. net. With the aid of coloured and numerous other illustrations, Capt. Hawks describes the charms of the microscope and its revelations. Throughout the volume the author endeavours to describe the various forms of animal and plant life in simple language. We are glad to see our old friend Mr. Chas. D. Holmes has assisted in the preparation of the volume.

The Romance of the Microscope. By C. A. Ealand. Seeley Service & Co., 314 pp., 7s. 6d. net. The sub-title perhaps defines the scope of the book:—'An interesting description of its uses in all branches of science, industry, agriculture, and in the detection of crime, with a short account of its origin, history and development.' Certainly Mr. Ealand seems to have dealt with almost every possible aspect of microscopic work—rocks, medicine, seaside life, chemistry, plant life, etc. There are several suitable illustrations.

Devonian Floras: a Study of the Origin of the Cormophyta. By E. A. N. Arber. Cambridge University Press. 100 pp., 7s. 6d. net. We should like to thank the Royal Society, Mrs. Arber, Dr. D. H. Scott and the Cambridge University Press for making the perusal of this volume possible. The late Dr. Newell Arber's notes on this important aspect of palaeobotany were nearly ready for publication when his untimely death prevented the memoir receiving his personal revision. Still his work is produced by careful and sympathetic hands, and in its present form is a welcome introduction to the beginnings of plant life. There are several illustrations.

South African Mammals: A Short Manual for the Use of Field Naturalists, Sportsmen and Travellers. By Alwin Haagner. London: H. F. and G. Wetherby. 248 pp. 20s. net. The Director of the National Zoological Gardens of South Africa is particularly well qualified to write on the mammals of this area. The book is on sound scientific lines; mammals large and small are dealt with, and his descriptions are illustrated from photographs of living animals and of trophies. The book will particularly appeal to the great number of public and private 'trophy' owners, and museum curators particularly will find it of service. The book is well produced.

SEX HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

(Continued from The Naturalist for 1920, p. 328).

All this would, of course, apply equally to the male, the demands of the one sex reacting on those of the other, till what had once been the nesting territory of either a single, or, perhaps, of various pairs of birds, would have become transformed into a place where a number of males met together, to court any arriving female. In the latter, or even perhaps in both cases, it is possible that the standing-place, which each male separately occupies on such an assembly-ground, may correspond to the ancient 'headquarters' of the nesting territory, or, at least, represent a continuance of the habit of having such a special resort, as to which Howard's work, 'The British Warblers,' may be consulted. For, in any transition, such habits belonging to the old state of things as could be adapted to the new one would be likely to remain, rather than that similar new ones should establish themselves about the central change. Thus one might expect that as the females, in the case supposed, became ready to lay their eggs, places suitable for this would again be chosen on or near the old sites, but there might be a check to this, since what had once become an assembly-ground would be likely to remain so during the whole of the breeding-season. This is in accordance with my own observations, so far at least, as the males are concerned, and a space thus occupied would not be well fitted for the performance of the domestic duties, at least in the case of some ground-laying species. Numbers, however, and the amount of space available, would be now the governing factors.

In this way, merely through an increase in the numbers of any monogamous species, I can understand what had once been the nesting territory of one or more pairs, passing into a general assembly-ground, for the purpose of courtship, and this habit, once formed, might continue, though the original cause of it had ceased to exist. This, as explained, would bring sexual selection as between individuals—which is Darwinian sexual selection—into play,* but why should the latter imply polygamy, or even, in certain cases, have attained to promiscuity? This seems more difficult to explain, since, when once a choice had been made, there would seem to be no reason why the earlier monogamous instinct should not reassert itself, with the result of a hasty return to the flesh-pots

* Darwinian sexual selection is, I believe, largely nullified where monogamous species are concerned, through their habit of pairing for life.

of Egypt. I noticed, however, in my study of the nuptial habits of the Blackcock, that when one of the hens had paired with any selected male, she immediately flew away, and was not accompanied by the latter.* This, at first sight, may seem strange, in either case, but, on reflection, one can understand it. The hen has become accustomed to repair to a certain place, for a certain purpose, with which her mind, at that time, is fully occupied. Consequently when that purpose had been fulfilled she would have the feeling that all was now done which she had come to that place to get done (the feeling of completion), which would, in itself, suggest leaving it, and, moreover, this would be the readiest way to avoid further solicitation, which would now be distasteful to her. When the want again arose, however, it would be, as before, in association with the place, a return to which would be, for her, by custom, a necessity. It would therefore be no advantage for the male of her then, or at-any-time choice, to accompany her, and, his want also having been satisfied, he would not, at the moment, feel any stimulus to do so; beyond that which prompts either one of any mated pair of birds to follow the other, which, however, does not always act immediately. But this prompting would now be controlled by a special instinct of what we may call gregarious or social or public courtship, at a certain place, and of waiting at that place, for the hens to come to it. Those males who most duly stayed on the spot would have the best chance of being frequently chosen, so that the habit and the advantages conferred by it would mutually strengthen each other. A separative influence, therefore, would now be set up between the sexes, which would lead to the domestic activities falling upon the female alone, whilst the energies of the male would be solely centred upon courtship. Under the earlier and, still, more common form of sexual selection, we see, indeed, a tendency towards this specialisation of duties, but it is weakly carried out, and often more or less completely in abeyance. For its full (and, no doubt, highly advantageous) development it was necessary that the primitive conjugal shackle should be broken, which, by the full Darwinian extension of the principle, has, at length, been accomplished.

The above speculations arise legitimately out of the subject of this paper, for how, when once the pairs are united, can sexual selection, in the ordinary sense of it, apply, in the case of these Grebes, who are not only monogamous, but, in my opinion, mate for life? Yet, if the selective principle does not then obtain, how are we to explain their elaborate and diverse conjugal posings, etc., which would, in that case,

* *Zool.*, July, 1910, pp. 249-50, 252.

be so much wasted energy? On the other hand, if selection can act and produce marked results, in the way here supposed, a further development of it does not seem required, and the difficulty is now to explain the existence of Darwinian sexual selection, for that it does exist, amongst birds, my own observations have demonstrated,* as have those of Professor and Mrs. Peckham, that it does amongst spiders.† But if the passage has come about in the manner suggested by me, then it may be said to have been a fortuitous one—dependent, that is to say, upon an entirely outside factor—and this I take to mean that, in spite of the magnitude of the advance, it was not imperative.

Further views, of a less enlarged scope, will, and indeed must, arise on the actions of these birds, as recorded in my diary, for, the fact is, their extraordinary habits are a very mine of reflection.

FEB. 22ND.—In the less reedy parts of the two most contiguous reservoirs here, there were, to-day, nine of the Crested Grebes, which I took to consist of four mated couples and a bird over. This was demonstrably so in several cases. Two pairs, for example, I saw dallying, and one of these, at any rate, nebbled—touched bills, at least, that is to say. It was not carried to the extent of yesterday, as I believe. Here, again, it struck me that the twitches, rather than shakes, of the head, were accessory only to the nebbing, intended or felt by the birds to be so, though overgrown, and become a sort of nervous appanage of it. On Wilston Reservoir, I saw another pair thus acting, and again I felt convinced that the beaks were in contact. So slender are they, however, that, at these distances, it is difficult to be certain that one actually sees the thin lines touch—rather what one does see seems to make this a necessity.

Several times, to-day, I saw a bird rise precipitately from the water, and fly, for some distance over it. The circumstances, in each case, made it likely that this was a flight from an enemy attacking subaqueously, so that we have here one cause of such flying about as does take place during the supposed pairing-up time of these Grebes; for really there is no such process, but only that of the ripening of certain activities in already mated couples. It must, I think,

* *Zool.*, Aug. and Nov., 1906, Feb., May and Oct., 1907.

* *Zool.*, Nov., 1909, and Jan., Feb., May and July, 1910.

† I am unable now to refer to the paper itself, but salient extracts from it are given in Professor Poulton's 'The Colours of Animals' (International Scientific Series). The facts seem to me as demonstrative as if they had been thought out, and arranged beforehand, by an unscrupulous advocate of sexual selection, who was also a great magician—or chemist.

however, be very little, for this is the most I have seen of it hitherto. I also, to-day, saw the fighting action proper with which two birds, in appearance equally resolute, advance upon one another. This is that usual one in aquatic species, viz., the whole length flat on the water, the bill in one straight line with the head, neck and body, suggestive of the ram of a war-ship. When, however, they were quite close, and the battle seemed about to be tried, on one making only a slight dart forward, the other would incontinently turn tail, and swim away at full speed.

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Fungi in Yorkshire, etc.—*Coprinus atramentarius* has appeared in profusion on the grounds of Welbeck Abbey. It seems a pity this edible fungus has settled down where its esculent properties are unappreciated. A few years ago an outburst of this species occurred on a patch of rich soil in the public park at Selby; their edible qualities were pointed out to some of the members of the local society who 'sampled' a quantity to their entire satisfaction. *Reticularia Lycoperdon* has been particularly abundant on the old willow trees in the Selby district, in conspicuous white patches from three to six inches across. This is perhaps one of the earliest of the Mycetozoa. It would be of value if observers could record the order of appearance of different species of Mycetozoa throughout the season; there seems to be a lack of information in this direction. A few days ago Mr. J. F. Musham brought me an abnormal little fungus having gills somewhat reticulated on the *pileus*, suggesting one of the Morel group. Microscopic examination proves it to be a basidiomycete (spores exposed on basidia). The spores of the Morels are enclosed in asci (sacks). It appears that this fungus, *Tubaria furfuracea*, had been accidentally bent down and become inverted, and had developed its gills on the upper surface of its *pileus*, so that its spores would be more easily distributed. Occasionally this abnormality is observed in the field, where a growing fungus has been overturned, but more frequently with the polypores than with the agarics. It seems hard to understand what forces induce these plants to take a right-about face in their growth. The three polyporoids which created some controversy at the Helmsley Foray were shown at the British Mycological Society's Foray at Minehead, and they still remained unsettled. Mr. A. A. Pearson, sent them to Mons. Bourdot of Paris, who has pronounced them to be *Merulius corium* Fr., *Trametes mollis* Fr., and a nodulose form of *Polyporus* (*Zanthochrous* Pat.) *radiatus* Sow. He considers that *P. nodulosus* is only a form of *P. radiatus*, having a rounded obtuse edge to the *pileus*.—W. N. CHEESMAN, Selby, 20th March, 1921.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 86).

Xysticus kochii Thor.

Rarer than the last and of much more restricted range; commoner in the south than in the north of England; absent from Irish list, but recorded for St. Kilda and widely distributed on the Continent. Season as in the last. First occurrence—R. Butterfield, Wilsden, May, 1907.

V.C. 61.—Wildcat Lane, near Hull, several examples, T.S. (*Trans. Hull Nat. Fd. Club*, 1908).

V.C. 63.—Wilsden, 1 ♀; Grassington, 1 ♂, R.B.

X. pini Hahn.

Common in the south of England, but rare in the north and with a wide Continental range; in Ireland, has occurred in Munster; on furze, etc. Season as in the last.

V.C. 62.—Langdale End, 1 adult ♀, R.A.T., June, 1914.

X. sabulosus Hahn.

Widely distributed in Gt. Britain as far north as the Grampians, but much commoner in the south than in the north; found in three localities in Connaught and abroad in Sweden, Belgium, France, Germany, Hungary, Spain and Greece. Season as in the last.

V.C. 62.—Eston Moor, 1 ♀, April, 1911, J.W.H.

X. erraticus Bl.

Not common, but widely distributed in Ireland and Wales, and a few widely separated localities in England and Scotland, as far north as Aberdeen. Abroad—Scandinavia, Belgium, north-east France and Central Europe. *Adult* from spring to autumn. First occurrence—T. Stainforth, Spurn, May, 1908.

V.C. 61.—Spurn, 2 ♀s, and cliffs north of Bridlington, 1 ♀; Snake Hall Moor, ♂, T.S.

V.C. 62.—Eston, not uncommonly amongst rubbish under whin bushes, J.W.H.

X. ulmi Hahn*

In England of more southern range being reported from Dorset, Sussex, Glamorgan, Oxford, Wicken Fen, Lincs., Staffs., and Northumberland; not yet known from Scotland, but recorded from five localities in Leinster. Abroad, extending from Norway (64° N.) through Sweden, Belgium and north-east France, Germany, Austria, Hungary and Croatia to south Russia. In similar situations to the rest of the genus and usually plentiful where found.

V.C. 63.—Martin Beck Wood, 2 adult ♀s, and immature examples, July, 1917, C.

Gen. *Oxyptila* Sim., 4-9.

O. atomaria Panz.

Widely distributed in Ireland and reported from various localities in Great Britain as far north as the Grampians; continental range also extensive. Much less abundant than its near ally, *O. trux* Bl. *Adult* summer and autumn. First record—T. Stainforth, Spurn, June, 1908.

* *X. ulmi* Hahn. sub *Thomisus Westwoodii* Camb., *Trans. Linn. Soc.*, Vol. XXVII, p. 405, recorded as from Yorkshire, should have been described as from Oxfordshire.

V.C. 61.—Spurn, 1 example; Bielsbeck, 1 ♂, 2 ♀s; Skipwith Common, 1 ♂; Brantingham Dale, 1 ♂, T.S.

V.C. 62.—Eston, J.W.H.

O. praticola C. L. Koch.

Very widely distributed on the Continent and in England, but not common in Ireland and not yet noted for Scotland. *Adult* summer and autumn, ♀s throughout the year. First record—R. H. Meade, 1851, S.G.B.I., sub *Thomisus incertus* Bl.

V.C. 61.—Park Avenue, Hull, 1 example, at roots of grass (*Trans. Hull Nat. Field Club*, 1908); Keyingham Drain, 1 ♂, Bielsbeck, 1 ♂, T.S.; Newport, 1 ♀, E.A.P.; Kelsey Hill, E.A.P., T.S.; Bubwith, J.F.

V.C. 63.—Bradford, R.H.M.

V.C. 64.—E. Keswick, adults from herbage, immature examples from a heap of stones; Stubbing Moor; Chandler's Whin (York).

O. flexa Camb.

Described in 1895, now known from eleven widely separated English counties as far north as Northumberland, and three localities in Leinster; not yet recognised on the Continent or in Scotland; usually in dampish situations, amongst low vegetation.

V.C. 64.—East Keswick, an adult ♀ from the top of a grass-covered wall in the village, June, 1903.

O. trux Bl.

The commonest of the genus in Yorkshire, very widely distributed in the British Isles and in the north-west and centre of Europe; amongst low vegetation, grass, fallen leaves, etc.; sometimes beneath stones and in damp places. *Adults* throughout the year. First occurrence—the author, Stubbing Moor, September, 1901.

V.C. 61.—Hornsea Mere, Market Weighton, Houghton Woods, Brantingham Dale, Bridlington, Sand-le-mere, Withernsea, Cherry Cob Sands, Brough, Newbald, T.S.; Kelsey Hill, E.A.P.; Riccall Common, W.P.W., W.F.

V.C. 62.—Cleveland, 'every locality visited,' J.W.H.; Scarborough, S.M.; Beast Undercliff, Staintondale, T.S.; Carnelian Bay; Scalby Mill; Ringingkeld Bog; Hayburn Wyke; Kilton Woods; Marske.

V.C. 63.—Martin Beck Wood, C.; Deffer Wood (Cawthorn); Carr Wood, Woodsome, rare in last named.

V.C. 64.—Newby Moss (Ingleborough), W.P.W.; Kingsdale and Thornton-in-Lonsdale; Adel, near Seven Arches, and bog; E. Keswick; Collingham Lane; Rigton; Linton Common; Stubbing Moor; Scarcroft Hill (Thorner); Chandler's Whin (York).

Sub-fam. PHILODROMINÆ, 4-14.

Gen. *Philodromus* Walck., 3-12.

P. dispar Walck.

Generally distributed in England and Wales except in the northern counties; once recorded for Ireland, but not yet for Scotland; continental range extensive. *Adult* May and June. First occurrence—the author, Knaresborough, April, 1906.

V.C. 61.—Leconfield Moat, 1 ♀, T.S.

V.C. 63.—Maltby, 1 immature ♀, W.P.W.

V.C. 64.—Bishop Wood, 1 ♀, T.S.; Birkham Wood (Knaresborough), 1 immature ♀; Hackfall, 1 ♀.

P. aureolus Clerck.

Common over the whole of the British Isles and Europe, Asia eastward to China and Kamtschatka, and in N. America; beaten from bushes and the lower branches of trees. *Adult*

May to July. First occurrence—the author, E. Keswick, June, 1903.

- V.C. 61.—Humber Bank East, H.C.D.; Hessle and Kelsey Hill, E.A.P., T.S.; Houghton Woods, North Cave, Birkhill Wood, Saltend Common, Spurn, T.S.; Bubwith, J.F.; Rillington.
- V.C. 62.—Middlesbrough district, common everywhere, J.W.H.; Scalby Mill; Scarborough; Carnelian Bay; Raincliff Woods; Ringingkeld Bog.
- V.C. 63.—Martin Beck Wood, Dr. Corbett; Askern.
- V.C. 64.—Burley-in-Wharfedale, W.P.W.; Adel Moor; Roundhay Park (Leeds); Chapel-Allerton; Harewood; East Keswick; Collingham; Dalton Lane; Tadcaster; Knaresborough; Chandler's Whin (York).

P. cespiticolis Walck.

Common and widely dispersed in the British Isles and abroad. By some considered merely as a variety or sub-species of *P. aureolus*, as on the Continent several intermediate forms occur. In the British Isles these do not occur, and the males of the two species (but not the females) are easily differentiated. Season and habitat the same. In my own experience the commoner of the two species in Yorkshire. First occurrence—the author, E. Keswick, June, 1903.

- V.C. 61.—Kelsey Hill, E.A.P.; Sutton, Houghton Woods, T.S.; Selby, Riccall and Skipwith Common, W.P.W., W.F.; Rillington.
- V.C. 62.—Middlesbrough district, common everywhere, J.W.H.; Scarborough and district; Cloughton.
- V.C. 63.—Askern and Campsall; Roche Abbey.
- V.C. 64.—Leeds and district; Adel; Harewood; E. Keswick; Linton Common; Collingham; Dalton Lane; Tadcaster; Knaresborough; Bishop Wood.

Gen. *Tibellus* Sim., 1-2.

T. oblongus Walck.

Very widely distributed in the British Isles, Europe and Asia; found also in N. America; amongst long grass, often on coast sandhills, sometimes in damp places. *Adult* June and July. First occurrence—the author, Dalton Lane, May, 1903.

- V.C. 61.—Spurn, E.A.P., T.S.; Kelsey Hill, E.A.P.; Sand-le-mere, Houghton Woods, Saltend Common, Humber shore at Welwick, Weedley, Sunk Island, T.S.; Kilnsea.
- V.C. 62.—Eston, J.W.H.
- V.C. 63.—Martin Beck Wood, C.; Roche Abbey ruins.
- V.C. 64.—Common at some of the following places—Wetherby, J.G.; Linton Common; Stubbing Moor; Dalton Lane; near Thorner, sides of ditch by roadside.

Fam. SPARASSIDÆ, 1-1.

Gen. *Micrommata* Latr., 1-1.

M. virescens Clerck.

Not uncommon in the south of England; noted also for the west and south of Ireland and widely distributed on the Continent from south Scandinavia to south Russia. There are only two other British northern records, viz., 1 ♀, Chat Moss (Lancs.), and Killingworth (Northumberland). First occurrence—M. Malone, Grass Woods, Sept. 4th, 1908.

- V.C. 64.—Grass Woods, Grassington, 1 ♀, M.M.; later other females by Messrs. Winter, Butterfield, Fisher, Sutcliffe and Sanderson.

Fam. CLUBIONIDÆ, 23-40.

Gen. *Chiracanthium* C. L. Koch, 1-3.*C. carnifex* Fabr.

Widely distributed in the British Isles as far north as the Grampians, and on the Continent, Sweden, N. and E. France, Central Europe and Italy, but not common in Ireland; amongst low vegetation. *Adult* ♂ June and July, ♀ throughout the year.

First occurrence—the author, Ringingkeld Bog, August, 1906.

V.C. 61.—South Cave, an adult ♀, T.S.

V.C. 62.—Whitby Moors, two adult ♀s, R.A.T.; Ringingkeld Bog, many immature examples.

V.C. 64.—Sawley High Moor, ♀.

Gen. *Clubiona* Latr, 14-18.*C. terrestris* Westr.

Generally distributed in the British Isles as far north as Inverness, and usually common; with a wide range also on the Continent; amongst low herbage, fallen leaves and grass and on bushes, mostly in woods. *Adult* April and May chiefly, but examples also later. First occurrence—the author, Slaithwaite, May, 1897.

V.C. 61.—Bentley Woods, 1♂, 1 ♀, E.A.P.; beech wood at South Cave, both sexes, T.S.

V.C. 62.—Helmsley, H.C.D.; Forge Valley, near Scarborough, R.A.T.; Riftwood (Saltburn); Kilton Wood.

V.C. 63.—Bradford, G.H.O. (V.C.H.); Calverley, S.M.; Harden, Hurst Wood (Shipley), W.P.W.; Bingley Woods, R.B.; Askern; Maltby; Deffer Wood; Shackleton Wood and Hardcastle Crags (Hebden Bridge); woods in the Huddersfield district at Slaithwaite, Marsden, Holmfirth, Honley, Stocksmoor, Meltham, Crossland, Farnley, Storthes Hall, Woodsome, Lepton and Hopton, but not in any quantity.

V.C. 64.—Trench Wood and Shipley Glen, W.P.W.; Roundhay Park (Leeds); Alwoodley; East Keswick; Crag Top (Knaresborough).

C. grisea L. Koch.

Widely distributed in Great Britain as far north as Moray Firth, but rare in Ireland; abroad recorded from France, Germany and Hungary; amongst low herbage, usually in damp places. *Adult*, in spring and early summer. First record—G. H. Oliver, V.C.H., 1907.

V.C. 61.—Spurn, both sexes, E.A.P., T.S.; Stone Creek, ♀, Withernsea Carrs, ♀, Kelleythorpe, ♂, Kilnsea and King's Mill Marsh (Driffield), many of both sexes, Humber bank between Hull and Hessle, T.S.; Pulfin Bog (Beverley), ♀, E.A.P.; Skipwith Common, many of both sexes, W.P.W., W.F.

V.C. 62.—Eston, J. W. H.; Ringingkeld Bog, near Scarborough, R.A.T.; Coatham Marshes and Tees Mouth.

V.C. 63.—Bradford, G.H.O.; on bramble near Cartwright Hall, Bradford, W.P.W.; Martin Beck Wood, Doncaster, C.

V.C. 64.—Camblesforth, near Selby, J. F. Musham; Adel, near the Seven Arches.

(To be continued.)

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A letter appears in *The Museums Journal* suggesting that provincial museums curators should keep a watchful eye on their respective districts when changes in the ownership of property are likely to occur. We expect these unfortunate people will next be told how to blow eggs!

PSEUDODIADEMA VARIOLARE (BRONGNIART) IN THE LOWER CHALK OF NORTH LINCOLNSHIRE.

T. SHEPPARD, M.SC., F.G.S.

AMONG a collection of specimens obtained from the well known Chalk Quarry at South Ferriby is a fine and well preserved example of *Pseudodiadema variolare* (Brongniart), the matrix of which shows that it is from the Marl bands immediately below the *Belemnitella plena* zone. The specimen, which was sent for examination to the Palæontological Department of the Geological Survey, is 32 mm. in width. So far as I can ascertain, the species has not been recorded for Yorkshire, the only reference to the genus in the Lower Chalk in Yorkshire occurring in Prof. Barrois' paper, 'Recherches sur le Terrain Crétacé Supérieur de l'Angleterre et de l'Irlande,' as having been obtained at Speeton.

With regard to Lincolnshire, the late Wm. Hill, whose classic paper on the Lower Chalk of that county appeared in the *Quart. Journ. Geol. Soc.*, 1888, p. 320, evidently never succeeded in securing a specimen himself, and the only record I can find of the species for the county occurs in a list of fossils from the Lower part of the Lower Chalk, on page 143 of the *Geology of part of East Lincolnshire*, Geological Survey Memoir, 1887. Here the species is recorded as having been found at Grebby, but I cannot find any reference to it in the text of the Memoir.

More recently (*Proc. Geol. Assoc.*, Vol. XXVI., pp. 333-359) C. R. Bower and J. R. Farmery have made a zoological record of the contents of 'The Zones of the Lower Chalk of Lincolnshire,' and this record contains particulars of several additions to the fossil fauna of the beds described, but even the genus is not mentioned by them; thus the fossil would seem to be very rare.

A little while ago the Hull Museum purchased from Mr. Bower the fossils figured and described in this paper; among them are portions of one or two immature individuals which might possibly be referred to *Pseudodiadema*, but are not sufficiently well preserved to enable the staff at the Geological Survey Office to define. I am informed that the Grebby specimen is in the Museum at Jermyn Street, so that this example, which is not a particularly good one, and that now described, appear to be the only two records of *Pseudodiadema variolare* for the Chalk of the North of England,

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The Haworth Ramblers continue to issue their valuable programmes, the one for Easter Monday, on Giggleswick and Settle, being of special interest. It deals with the Museum, Ebbing and Flowing Well, etc., and is written by Jonas Bradley.

FIELD NOTES.

Sturgeon at Whitby.—A sturgeon was captured about seven miles off Whitby by a local trawler and brought in here on March 21st; length, 75 inches; girth, 30 inches; weight, 68 lbs. The fish was purchased and presented to the King.—F. SNOWDON, Whitby.

Wood Ant in Cumberland.—This ant (*Formica rufa*) is very local in Cumberland, so it is a pleasure to be able to add a new habitat for it. Last July, at Caldbeck, I found two large nests on the side of a bank in a large mixed wood under Parkhead. The insects, as usual, were swarming everywhere in the wood, but I saw them nowhere else in the district. The only other place in Cumberland where I have seen *F. rufa* is in the woods on the Eastern shore of Derwentwater, where it constructs large nests of the Fir needles. It is also reputed to occur in woods about Bassenthwaite. As it is very like *F. sanguinea*, I captured a few specimens and submitted them to Mr. F. H. Day, who says they are undoubtedly *F. rufa*.—JAS. MURRAY, 2 Balfour Road, Carlisle.

Heronries in Yorkshire.—An agitation is being started among the anglers of Yorkshire to induce, through the Fishery Board, the County Council to remove the protection from the Heron. As we have, apart from Hornsea Mere, no large Heronries in Yorkshire, and as they are not increasing, there is no justification for this demand. An unfortunate feature of present-day existence is that if any body of men imagine they have a grievance against any wild creature, they immediately start an agitation for its destruction, disregarding the fact that their particular class is a small one, in comparison to the great numbers of the population who would delight to speak of this bird only, in being able to view a Heron, even a passing glimpse. We hope our Protection Committee will ensure that the protection is not removed.—R.F.

Hypnum crista-castrensis Linn. near Carlisle.—This, one of the most beautiful of our mosses, has long been known from the Lake portion of Cumberland. Binstead, in 'The Victoria History of Cumberland,' says it is not uncommon in woods about Keswick, and it has also been gathered in Borrowdale by Mr. W. H. Pearson (*Nat.*, 1898, p. 118). Braithwaite also gives Borrowdale as a locality. It is not included in Wood's 'Contribution to a List of Cumberland Mosses,' so it was an unexpected pleasure to meet with a nice patch of it in a young fir wood near Little Orton, about four miles west of Carlisle. It was on the ground, near the edge of a damp ditch, and well shaded. There was a slight admixture of the moss *Plagiothecium undulatum* B. and S. and the Hepatic *Aplozia crenulata* Sm.—JAS. MURRAY, 2 Balfour Road, Carlisle.

In Memoriam.

DR. L. C. MIALL, F.R.S.*

A distinguished Yorkshire naturalist and teacher, Dr. Louis Compton Miall, F.R.S., Emeritus Professor of Biology in the University of Leeds, died towards the end of February, at an advanced age.

Dr. Miall is well entitled to a place among the most eminent scientific workers of the last half century. In Nature study



he was a pioneer, showing how it should be taught on useful lines. One of Nature's humblest and most patient investigators, his reward was in the pleasure of work. He had a great gift of exposition. His researches were chiefly concerned with the intricacies of insect structure. His publications are so lucid that they can be read with unflagging interest and pleasure by savants and laymen.

For a period of thirty years Dr. Miall filled the position of Professor of Biology at the Yorkshire College, and in the University into which it expanded a few years before his retirement. He was born at Bradford in the year 1842, his

* We are indebted to *The Yorkshire Post* for these notes.

father being the Rev. J. G. Miall. Louis Miall attended the Silcoates School, and quickly distinguished himself. Whilst still quite a young man he became a teacher of classics, but relinquished this work in 1864 to become curator of the newly formed museum of the Philosophical Society of Bradford. Early in the 'seventies he accepted a similar position in Leeds. Here he revised and rearranged the contents of the Museum, whilst deeply absorbed in the study of botany and geology, especially the geology of the coal measures. About this period, too, he entered the Medical School, and studied anatomy for two years with a view to biology.

The Yorkshire College began its career in 1874, and Mr. Miall joined it as lecturer in biology soon after its foundation. He still retained his active interest in the museum, and his services as Curator cover the full period of twenty years, from April, 1871, to October, 1891. As a member of the University staff he was esteemed and admired by all his colleagues. On the inauguration of the University the honorary degree of Doctor of Science was conferred upon him.

In the art of teaching he must be placed among the reformers. He had had forty years of it, and saw many vital and beneficial changes brought about. Lecturing he did not consider a very effective method. He liked to draw his pupils out and get them to expound the knowledge they had gathered, a process which quickened the intelligence and stimulated private study. A lover of Nature, he was fortified in his investigations by an excellent knowledge of botany, geology and insect structure. His work on 'Aquatic Insects' is a classic; he wrote a text book upon 'Injurious and Useful Insects,' elaborate treatises upon 'The Cockroach' and 'The Harlequin Fly,' his other publications including 'Object Lessons from Nature,' 'Round the Year,' 'House, Garden, and Field,' and 'The Early Naturalists.' The last-named was published in 1912, and is a very interesting and lucid record of the growth of natural history, with a critical account of pioneer investigators.

In 1892 Professor Miall was admitted a Fellow of the Royal Society. In 1896 he presided over the Zoological section of the British Association which met that year at Toronto, and he was chosen president of the Educational Science Section of the Dublin meeting in 1908. In 1904-5 he was Fullerian Professor of Physiology in the Royal Institute.

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R. Gurney writes 'Notes on Some Irish Entomostraca,' in *The Irish Naturalist* for February. We notice that at a meeting in Dublin on Jan. 13th, 'a promising discussion was cut short by the approach of Curfew.'

The Journal of the Ministry of Agriculture, for March, contains a paper on 'The Improvement of Peaty Soils. I. The True Peats,' by Dr. E. J. Russell; and 'The Starling: is it injurious to Agriculture?' by Dr. W. E. Collinge. The answer is in the affirmative.

PEAT INVESTIGATION.

Good weather favoured the field meeting for Peat investigation on March 12th, when a party of thirty-five from Bradford, Burnley, Cowling, Crosshills, Huddersfield, Keighley, Leeds, Nelson and Skipton assembled at Lane Ends under the leadership of Mr. John Holmes for a visit to Cowling Moor, near Keighley.

The overflow channel of Statesden Clough showed an area where peat was forming at the present time ; obstruction of drainage by a causeway had developed a Rush and Sphagnum swamp. Proceeding to Smallden Clough a stretch of denuding peat was crossed, with sections to the underlying rock exposed in water courses ; the stream from Tom Well led to typical ground on which prehistoric flint implements have been found among stones and silt in storm channels ; one imperfect scraper with a worked edge, and a few flint flakes were picked up during the afternoon. Rooted stumps of oak and birch were examined at an altitude of 1,100 ft., and several logs with much debris of birch were exposed in the lower layers of peat along the stream sides. The position of the moor pan, separating more or less sharply the grey leached soil full of rootlets, from the underlying buff coloured sands, was examined, and in one place embedded stones were seen cemented into a hard conglomerate more nearly representing the massive pan found on ferruginous gravels, than is usually found on the West Riding Moors. The upper peat here showed signs of disturbance, being interbedded with silt as if re-distributed by flood water. Mr. Holmes stated that the moor traversed was the site of an ancient glacial lake of which two overflow channels were pointed out. On the return journey a spot was shown where a few years previously a sound oak log, thirty feet long and three or four feet in girth had been taken from the peat and sold to the late Samuel Margerison.

At Cowling ample accommodation for tea had been arranged by the thoughtfulness of Mr. Holmes, after which the party dispersed with general expressions of appreciation of a pleasant and instructive afternoon.

In the evening Mr. W. H. Pearsall gave a lecture on Peat Investigation to the Crosshills Naturalists' Society. Reference was made to the special facilities for such work existing in Yorkshire, where there is a greater extent of undisturbed peat than in any other county in the British Islands ; the possible value of such land now lying derelict ; the question of afforestation ; the various theories of the origin of the moors ; the influence of rainfall and the human factor were discussed, and attention was directed to the flat topped hills in Yorkshire where water tends to accumulate.

The breaking down of dead organisms to a soil rich in plant foods, by moulds, bacteria, worms and insects was dealt with ; also the complex adverse influences of deficiency of lime and potash, and the exclusion of oxygen by water-logging or other agencies, which resulted in a sequence of vegetation during the course of long ages, from oak on good soil containing five or ten per cent. of humus, through pine, birch, bilberry and hair grass to cotton grass moor, containing ninety per cent. of plant remains. The lecturer considered that in many cases peat was the ultimate stage of a natural sequence, following gradual exhaustion and stagnation of the soil, each stage being marked by vegetation capable of enduring more rigorous conditions than its predecessor.

A healthy stimulus was given to local workers by the formulation of a number of problems which required solution :—What amount of evidence, such as axe and fire marks, was there to support the theory of human influence on destruction of primitive woodland ?

What animal remains give evidence of the age of the peat ? An example of this, mentioned, was a large jaw of horse, found under eighteen feet of compact, undisturbed peat. The jaw was of such a size as to

preclude its being earlier than 1,000 A.D., when heavy horses were first introduced as chargers.

Was peat the result of peat formation or did it precede the peat?

On the round topped hills of Lakeland, peat often occurred at cloud level, *i.e.*, about 700 feet altitude. Was it so in Yorkshire?

All the trees seen during the afternoon were near streams, *i.e.*, near the drainage system. Did the distribution of timber in the peat in Yorkshire indicate changes in climate, or was it limited to positions where natural drainage encouraged trees?

In conclusion the lecturer suggested that the identification of organic remains in the peat offered work to the zoologist and the botanist which, despite its difficulty, necessitating the special study of minute structure, would, if successfully accomplished, throw valuable light on the conditions existing from time to time during the growth of the moors.

W. H. BURRELL.

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COMMITTEE OF SUGGESTIONS: INSECT ASSOCIATIONS.

A REPRESENTATIVE meeting of Yorkshire Naturalists' Union Entomologists took place at the Leeds University on March 17th; the Chairman of the Committee, Prof. Priestley, presiding. Mr. H. H. Wallis, whose paper in *The Naturalist* for March provided the basis for discussion, stated the work that had been done in this subject, Dr. Cameron's work in Cheshire, Col. Gunter's compilation of insect appearances with various weather factors in *The Transactions of the Entomological Society*, and Mr. Shelford's notes on evaporation factors and time of emergence, being referred to more especially. Mr. T. H. Taylor pointed out reasons why more intensive study of a few definite insects was desirable; he cited the Turnip Moth, *A. segetum*, and stated that he was quite unable to say how much of the damage ascribed to this might be due to *A. exclamatoris*; he also mentioned the Antler Moth and its sudden enormous development and then comparative absence; very little is known as to when its eggs, laid in the autumn, hatch out and develop. Another type of insects requiring careful study are the Click Beetles.

Prof. Priestley pointed out that in the botanical world ecology by systematizing and tabulating had happily brought together the results of the field and the laboratory workers, either of whom previously spoke and recorded their discoveries in language that the other could not understand, and similar conjoint work is wanted in entomology.

Mr. E. G. Bayford said that in Mr. Wallis's paper there was an evident mistake, *Dytiscus punctulatus* should be *lapponicus*. He stated that the reason for the scarcity of such species as the Swallow-tail and Black-veined White Butterflies* is due to extermination by collectors; he instanced Thorne Waste as an area so well worked that an insect association could be drawn up for it from published records.

Mr. B. Morley, who has done much work in Lepidoptera on the lines suggested, remarked on the interesting features some insects show when their distribution is mapped, compared with other more protean species; also on the necessity for very careful examination of all data, and as an example he pointed to a larva mentioned by Cameron as feeding on certain low herbs, whereas it hides in these during the day and feeds on the trees above at night. He mentioned that certain different species seem always to occur together, a suggestion of small associations.

Mr. W. H. Pearsall thought the matter would not rest with plants

* Both the Swallow-tail and Black-veined White Butterflies are now abundant in their British localities; the Swallow-tail never has been scarce.—G.T.P.

and insects as the whole animal kingdom is involved, and will have ultimately to be included in the study, owing to their inter-relations.

From the discussion it was evident that many facts were known and only await a system of tabulation; the best methods to adopt require further consideration, and suggestions will be welcomed by the Committee.

CHRIS. A. CHEETHAM.

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The Olicanian, Vol. XXII., No. 2, contains the concluding part of a paper by J. L. Illingworth, on the 'Migration of Birds.'

The Animal World for March includes papers 'Concerning Squids,' by W. S. Berridge, and on 'The Buzzard,' by R. Clapham, both being well illustrated.

Nature, No. 2678, contains an article on Human tails, in which an example bequeathed to the Royal Anthropological Institute by the late J. C. McLachan of Halifax, is described by Prof. Keith.

The Journal of Conchology for January contains the Rev. A. H. Cooke's Presidential Address on 'Evolution in the Molluscan Radula,' a 'Scheme for the Division of the British Marine Area into Census Areas,' by R. Winckworth, and '*Pisidium parvulum* Clessin in the Great Ouse and the Severn,' by C. Oldham.

E. Chance gives 'A Third Season's Observations on a Cuckoo,' in *British Birds* for March. He considers that under 'exceptionally favourable conditions a Cuckoo can and will lay up to twenty-one eggs in one season, and will deposit nearly all of them at intervals approximating to forty-eight hours.'

The January *Entomologist's Record* announces another addition to the editorial staff. There are now twelve editors, and the number referred to contains six items, thus averaging two editors per contribution! From the same journal we learn that the new meeting room of the Entomological Society has 'ample cloakroom and lavatory accommodation.' So that's that!

The Journal of Ecology, Vol. VIII., No. 3, besides Mr. Pearsall's paper referred to elsewhere, contains 'The Significance of the Calcareous Habit,' by E. J. Salisbury; 'Habits and Ecological Characters of three sub-varieties of *Festuca rubra* L.,' by W. O. Howarth; 'Changes in the Salt Marsh and Sand Dunes of Holme-next-the-Sea,' by S. M. Wadham.

What is described as the largest single block of granite ever quarried in the British Isles has been erected as a War Memorial at Leighton Buzzard. The monolith, which is illustrated in *The Quarry* for January, is of Shap Granite, 25 ft. 3 ins. long, 3 ft. 2 ins. square, and weighs over 22 tons. The same journal contains a paper on 'Slate and its Modern Uses,' by Prof. O. T. Jones.

The Entomologist's Monthly Magazine for April contains, among its numerous notes, 'Variation in British Psithyrus and remarks on *Bombus pomorum*,' by R. C. L. Perkins; 'Coleoptera in Hertfordshire and Berkshire,' by N. H. Joy; 'Observations on the Life-History of the Wheat-bulb Fly,' by F. R. Petherbridge, and 'The British Species of the Anthomyid genus *Limnophora* Desv. (Diptera),' by J. E. Collins.

The Essex Naturalist, Vol. XIX., Part 4, is a welcome publication, and among its valuable contents we notice 'British Oysters: Past and Present,' by A. Bell; 'On another Annotated Copy of Warner's *Plantae Woodfordienses*,' by P. Thompson; 'The Nesting of the Little and Common Terns in Essex,' by W. E. Glegg; 'More about Moorlog: A Peaty Deposit from the Dogger Bank,' by H. Whitehead (referred to on another page); 'Reports of Meetings, 1920'; 'The Birds of West Thurrock Marsh,' by P. W. Horn, and 'Æneas MacIntyre: A forgotten Essex Botanist,' by Miller Christy.

REVIEWS AND BOOK NOTICES.

Symbiosis : A Socio-Physiological Study of Evolution, by **H. Reinheimer**. Headley Bros., 295 pp., 15/- net. This is a solid and somewhat technical exposition of the author's theories that 'good (*i.e.*, symbiogenetic) survival tends more and more towards pacific and equal interchange and increase of the means of life ; *bad* survival is on the downward path of destructive despoliation of or parasitism, and is doomed in the long or short run to extinction.' Without clearly grasping all his arguments, we can gauge the nature of some of his opinions from the statement (p. 164) that 'views similar to the co-operative interpretation of evolution for which I have now for some years contended, have recently been advanced by . . . the editor of *Country Side*,' etc.

Well-boring for Water, Brine and Oil: A Manual of Current Practice. By **C. Isler**. London : E. and F. N. Spon. 3rd edition. 259 pp., 16s. net. The fact that this book has reached its third edition is some evidence of its value. It is the work of a practical man, and the numerous illustrations of the various methods of boring show that the author is qualified to write on the subject. An idea of the scope of the volume can be ascertained from the following titles to the eleven chapters :—Preface—Geological Considerations—Dug Wells—Driven Tube Wells—Bored Tube Wells—Kind-Chaudron Deep-boring System—Dru Deep-boring System—Mather and Platt Deep-boring System—American Rope-boring System—Deep-boring with Diamond Drills—Raising Water—Table of Aqueous Formations in the United Kingdom and Notes of Districts where such Formations exist.

The Place-Names of Northumberland and Durham. By **Allen Mawer**. Cambridge University Press, pp. xxxviii.+272. 20s. net. Students are greatly indebted to the Cambridge University Press for a number of scholarly works dealing with the place-names, to which is now added the volume before us. The author has received much information from the late Prof. Moorman, to whom he dedicates the book. Prof. Mawer deals with the Celtic, English, Scandinavian and French elements in the place-names ; there is a chapter on 'Names in *-ing*,' a fine bibliography, and then an alphabetical list of the place-names, with various scholarly comments thereon. The second part of the book deals with 'Elements found on the second part of place-names or used by themselves' ; and part 3, 'Personal names found as the first element in place-names.' There is much of interest to the naturalist, geologist, and archæologist in the volume, which is one of the best of its kind in the English language.

A New Activity? A treatise on Mrs. Dickinson's Discovery of a 'New Radio-activity,' with some notes on Radium, by **F. A. Hotblack**. Jarrold, Ltd., 195 pp., price 10/6. We believe we have met the author of this book, we have certainly met the lady whose portrait appears as frontispiece, and we have often chatted with Mr. A. W. Oke, who, we are informed in large type, 'contributes a Foreword,' (such 'foreword' occupying less than four lines), in which Mrs. Dickinson's researches are described as 'Radio-Activity in the Service of Man.' Yet with all these advantages, and a perusal of the volume, we regret we cannot say what is the precise nature of the 'discovery.' Some crystals found on some tissue paper under the lid of some cream soap preparation were found to be 'radio-active,' and by their aid wool has been cleaned, yeastless bread has been produced, corroded water pipes have been cleaned ; they mark glass, burn the skin, aerate water, are antiseptic, make cement and concrete, improve the heating power of coal, preserve fruit, improve plant seeds, make hair grow, soften and disintegrate ores, clean paper, stimulate animal life, improve wine, improve tobacco, felt and clay, preserve milk, heal wounds, etc., and even (p. 168) we learn that 'after 24 hours [in the cold store, the temperature being 27° F.] the sample of Mrs. Dickinson's water was found to be an unfrozen liquid.' As we have said, we can't make out what the new discovery is, but it must be wonderful.

YORKSHIRE NATURALISTS' UNION.

LIST OF SECTIONAL OFFICERS & COMMITTEES OF RESEARCH, 1921.

The President and Hon. Secretaries of the Union are ex-officio members of all Sections and Committees.

BIOLOGY.

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GEOLOGY.

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—: O :—

'Onion Smut (*Urocystis cepulae*)' is the title of Leaflet No. 365 issued by the Ministry of Agriculture and Fisheries.

Part 10 of Witherby's *Practical Handbook of British Birds* (pp. 81-176, 4/6) has appeared, and is devoted to Owls, Falcons, Eagles, Hawks and Kites. There are numerous plates and illustrations in the text.

NORTHERN NEWS.

The Naturalist costs, roughly, 30/- a page. We have much valuable matter waiting to be printed, and should like to give extra pages each month in order to cope with the arrears.

The *Journal of the Ministry of Agriculture* for April contains Part II. of Dr. Russell's paper on the 'Improvement of Peaty Soils,' 'Common Scab of Potatoes,' by W. A. Millard; 'Research in Animal Breeding,' by R. C. Punnett, and 'Isle of Wight Disease of Bees.'

The Beverley Corporation has issued a pamphlet on 'Lectures to Young People on the History and Antiquities in the Beverley Municipal Museum,' by Lockwood Huntley, Librarian. (39 pages, 6d.) It includes a chatty account of the collections. The articles originally appeared in one of the Beverley newspapers.

The British Museum (Natural History) as Economic Series No. 12, has issued:—'The Cockroach: Its Life-history and how to deal with it,' by Frederick Laing (18 pages, 6d.) The pamphlet contains a fund of valuable information on the life-history of Cockroaches, and on traps, powders, and other methods of keeping down their numbers.

The South-West Yorkshire Entomological Society continues to thrive, and is a valuable auxiliary to the Yorkshire Naturalists' Union. The members consist of enthusiastic entomologists, and they have recently issued a list of members, excursions, etc. This year the President is Mr. Ben Morley, and the Secretary, Mr. J. Hooper, Grosvenor Terrace, Middlesbrough, near Wakefield.

We learn from the *Yorkshire Evening Post* of April 12th that 'In a street in the outer suburbs one boy was punishing another so heavily that a passer-by felt compelled to intervene. "But, sir," explained the assailant, "I'm a Scout, and I found him taking all the eggs out of a nest." The intervener apologised for interrupting a Scout in the fulfilment of daily "good turn" and passed on.'

As an example of 'style,' we quote the following from an article on 'Early Trout,' written by an official at a public museum, who seems capable of writing upon any subject under the sun, or above it:—'If one has only moderate or no luck during the day, one may, if one returns again at twilight, experience very good sport. Indeed then one may fish on until it is too dark to see, and catch as many trout as one likes.' Ah, but what if there are *two*!

The Council of the Yorkshire Philosophical Society has appointed Dr. Walter E. Collinge, M.Sc., curator of the Museum, in succession to Mr. Oxley Grabham, resigned. Dr. Collinge is a native of Huddersfield, was educated at the Technical College in that town, the Yorkshire College, Leeds, and the University of St. Andrews. He was formerly a lecturer on economic zoology at the University of Birmingham, is a well-known authority on economic biology, and has contributed largely to the scientific press on this and kindred subjects.

The thirty-second annual meeting of the Hull Geological Society was held at the Royal Institution, Albion Street, recently. The Secretary's report showed that the fieldwork during the past year had been satisfactory although the continued lack of pre-war railway facilities prevented the carrying out of geological investigations in the more remote parts of the East Yorkshire area. The indoor meetings during the winter months had also been well attended, and the membership of the society had largely increased. The officers and council elected for the coming year were:—President, Prof. P. F. Kendall; past president, C. B. Newton, vice-presidents, Dr. A. Harker, G. W. Lamplugh and F. F. Walton; secretaries, W. H. Crofts, J. W. Stather, and W. C. Ennis; treasurer, Jas. H. Wilson; editor, Thos. Sheppard; recorder, Chas. Thompson.

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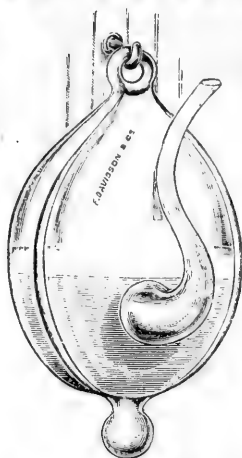
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A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

THE BRITISH ASSOCIATION REPORT.

For more years than we care to remember we have been drawing attention to the desirability of publishing the Report of the proceedings of the British Association during the same year that the meeting was held, and we have pointed out that nearly all of the report is *in type* when the meeting takes place. We have been assured, in reply, that such prompt publication would be impossible. Anyway the 'impossible' was nearly achieved in connexion with the Report of the Cardiff meeting, as it appeared within a month of the close of 1920*; and we have reason to hope that the report of the Edinburgh meeting of 1921 may appear before December 31st next. But—and we are sorry there is a 'but'—for the first time in the history of the Association its Report has appeared in paper covers, and may easily be overlooked or mistaken for one of John Murray's periodical publications. Surely the Annual Report of the principal Society of its kind in the world should appear in a worthy case? It is not creditable to the Association. True, possibly a hundred pounds or so may have been saved, but every member who values his 'set' of reports, every library and institution, must now go the expense of binding. We find that cloth cases are on sale at 2/- each. After writing for this, it costs a further and greater amount to have it put on the paper pamphlet. Would it not have been better to have sent a postcard round informing those who wanted to have their Reports bound in cloth to send the necessary extra cost—2/6 at most? As it was we had to send a card saying whether we wanted the Report at all or not, and for the credit of British Science the volumes sent to colonial and foreign institutions might have had a decent cover. We don't want to see 'Hull, 1922,' printed on a thing like the envelope of a telegram, when the Association next visits Yorkshire!

THE MINERALOGICAL MAGAZINE.

The Mineralogical Magazine for March contains 'Identity of Trechmann's " β -tin" with stannous sulphide,' by L. J. Spencer; 'A refractometer for the determination of liquid mixtures,' by H. H. Thomas and A. F. Hollimond; 'A method of constructing rock-analysis diagrams on a statistical basis'; 'A valuable Appendix of Mineralogical Abstracts,' and the Report of the Committee on British Petrographic Nomenclature. This last is most valuable; the complete rejection of several names is recommended, and no new names are proposed.

* The title-page is dated 1920 in error.

LORD SUDELEY ON MUSEUMS.

Lord Sudeley, who has taken such a prominent part in the popularisation of Museum collections, has favoured us with a copy of his remarks on Public Museums and Galleries, and the discussion thereon, appearing in 'Parliamentary Debates, House of Lords, Wednesday, 9th March, 1921, Vol. 44, No. II., Official Report.' In this the noble Lord gives an admirable summary of the various ways in which the different national institutions are, by the aid of lectures and the publication of postcards, etc., doing excellent work. He also shows that, taken collectively, this great educational work is entirely defrayed from these publications and sales. Last year no fewer than 360,000 picture postcards were sold at the British Museum.

KEW GARDENS.

That the popular lecturing scheme is not always a success is shown from the following extract from his Lordship's speech :—' Now consider the case of Kew Gardens. As your Lordships know, the guide system was in force there for a short time. I brought the matter forward last year, and showed that it was supposed to be a failure simply because it was not carried out in the right way. I should like to mention that in any further arrangement made for guide lectures in other museums I hope they will follow the example of the British Museum, where the thing is done in a proper way. There people go and are absolutely free. There is no attempt to make any charge, and visitors can do exactly as they like. They can come and go, with the result that they are very much interested. At Kew Gardens it is exactly the opposite. There is a heavy charge. They commenced with a fee of 2s. 6d., though no doubt it was reduced after the first year to 6d., and the whole system was so framed as to make it as disagreeable as possible. People were made to write their names, and a constable went round with them, and the difficulty of finding the place was so terrible that many people gave it up in despair. Not only that, but, as I mentioned last year, the pathway to the place of meeting was marked by the word "Private," and many people went away thinking it was a lavatory. I know people who came from Sheffield and went away again. Those are the two systems, one good and the other distinctly bad, and I hope that the Government will not reintroduce the system which was in force at Kew Gardens until they are able to do it in a proper way.'

THE BRENT VALLEY BIRD SANCTUARY.

The Selborne Society has been most successful in carrying out the first part of its scheme to celebrate the bicentenary

of Gilbert White. Not only has the money been forthcoming to buy the wood which for 17 years has been maintained as the Brent Valley Bird Sanctuary, but also some additional land which the owners have been so good as to sell at a special price, seeing that the whole 26 acres will remain an open space for ever. The fund which has now been started for the upkeep and endowment of the new Gilbert White Memorial is progressing, and the latest contribution is a gift that will bring in £26 per annum.

RARE BIRDS.

Although quite close to London, and indeed coming into its postal district, many birds with which it might not be expected to meet, are to be seen in the Sanctuary. Among those which have nested (about 50 in number) are the Sparrow Hawk, Greater Spotted Woodpecker, Wryneck, Turtle-Dove, Hawfinch, Goldfinch and Wild Duck, while visitors include the Kingfisher, Magpie, Nightjar, Golden Crested Wren, Snipe, and Woodcock. It is in the wood that the experiments were carried out which resulted in the making of Selborne Nesting Boxes which have been sent all over this country, and to many parts of the world, particularly with a view to increasing the number of insect-eating birds which are beneficial to man. The Secretary to the Committee is Mrs. Wilfred Mark Webb, of the Hermitage, Hanwell, London, W.7.

THE LEVEL OF THE SEA.

We learn from the *Westminster Gazette* that 'when the primary levelling of the country was commenced in 1841 the datum line was 100 ft. below a mark on St. John's Church, Old Haymarket, Liverpool; but shortly afterwards it was changed to mean sea level of the Mersey at Liverpool, which was assumed to be 4.67 ft. above the zero of the tide gauge at Georges Ferry basin. This is the datum from which the altitudes on the Ordnance Survey maps are computed, but it is now known that the Mersey datum is eight inches below true mean sea level, so that all Ordnance Survey altitudes are too high by that amount. The altitude mark outside Greenwich Observatory is 154 ft., above mean water at Greenwich and 155.7 ft. above that at Liverpool, the difference being ascertained by a line of levels run through Blackheath, Dunstable, Arbury Hill, Bardon Hill, Axe Edge, and Whittle Hill, Lancashire.'

THE NEW 'BENCH MARKS.'

All over the country altitudes calculated from the Liverpool datum are shown on 'bench marks' placed on convenient walls, bridges, milestones, and even private houses. But these are being superseded by 8 ft. long granite pillars sunk in the ground and embedded in concrete, with the altitudes engraved on a brass plate on the top. These altitudes are

reckoned from mean sea-level at Dunbar, near the mouth of the Forth, and a line of these permanent 'bench marks' now runs from the South Coast of England, at intervals of thirty miles, to Whittingehame, about five miles west of Dunbar. Subsidiary 'bench marks' radiating from this main line of levels will eventually supply the whole country. A very accurate tidal gauge has been erected at Dunbar, and similar instruments have been placed at Newlyn and Felixstowe, and from these three stations the mean tide-levels of the sea will in future be taken.

IS THE CURLEW A RESIDENT BRITISH BIRD?

It has hitherto been universally acknowledged that the Curlew is a resident in the British Isles, breeding upon the moorland and wintering on the coast. In *The Field*, for April 2nd, Mr. Abel Chapman combats this idea, and states that the Curlew is not a resident, but a summer and winter visitor. The breeding birds arrive on the moors in February, often during the first week, but generally about the middle of the month; in severe winters they do not arrive until sometime in March. These new arrivals show every sign of being very tired after their long flight from their southern quarters, and take a week or more to settle down. When the breeding season is over, generally in July, the birds leave the moors for the coast, where they spend a month or so undergoing their autumnal moult (August-September). As soon as this is complete they depart for their southern quarters; this occurs in September. There is then an interval (when Curlews are practically absent) between the departure of the home-bred birds and the arrival of the main body of foreigners which winter here.

SIZES OF CURLEW.

An extensive movement takes place in October, when the coast 'fills up' for the winter. These winter residents stay until the end of May, when they depart for their northern breeding grounds. According to Mr. Chapman, these birds are small in size, averaging 26 oz. to 28 oz., with beaks $4\frac{1}{2}$ to 5 inches in length, whereas our home breeding birds turn the scale at 40 oz. and have beaks 7 inches in length. Mr. Chapman is such a fine 'field' naturalist that any views he propounds carry conviction. Our reason for drawing attention to his views is to suggest that all young Curlews our Yorkshire members come across should be ringed; it might then be possible to trace their movements and settle this question definitely, although I feel sure Mr. Chapman's ideas may be the right ones. On the moors round Harrogate, Curlews do not arrive in February, they come in March, and winter weather will drive both them and the Golden Plover into the lowland pastures, where they remain until conditions alter.—R.F.

SEX HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

(Continued from page 176).

FEB. 23RD.—More Grebes, to-day, on the Wilston water. There were, once, some fourteen or sixteen together—I forget now the exact number. But though thus in a flock, these birds, I am convinced, were all paired, for they had an invincible tendency gradually to fall into two here, and two there, even though there might be a more or less considerable, and even, sometimes, a great space between them. Of course when another couple entered this intervening space, and then, themselves, widened out, the paired formation was not so easy to detect, and one has only to apply this to the whole number to understand how successfully it might be masked. Nevertheless, the fact would, ere long, reveal itself, and was proved when first one, and then another of these couples confronted each other, with the characteristic love-actions, or even when, without these, they kept, for a considerable period, in close company. On various of the former occasions I believe that the birds nebbed, and did not merely shake their heads, till now, later in the day—between 2-30 and 3—I am sure that a pair did so. It was just as with that pair I first watched in Suffolk, and the twitchings or flirtings of the head suggested nothing but supplementary actions, unessential to the main one of touching the bills together. Such minor movements would be of no significance, had they not been gradually converted from a mere nervous trick, into the principal or even, as it would seem, very often, the one feature of the performance. As for the preening actions, which, though mingled with it, one cannot regard as being, even now, of any sexual value, not only are these, as before remarked, much indulged in by numbers of birds, but this is particularly the case with these Grebes. I do not know how, or to what extent, they may be troubled with insect, or other, parasites, but it is possible, perhaps, that this and heat of blood may go some way towards accounting for their undue obtrusion, without calling in less direct factors. Another aquatic bird—the Puffin—is troubled with two kinds of bugs or ticks, with the poisonous bite of one of which I am personally acquainted, nor can ever forget, since it produced in me an entirely new sensation of pain, which lasted for a very long time, afterwards, when the spot was touched. This species was about the size of a large house-fly or small blue-bottle, if I remember, but the other, as also verified by me, was fully as large and swollen as those fearful creatures that

are to be seen hanging on the bodies of oxen in South Africa—a terrible pest, one would imagine, for a bird of so small a size. It seems possible, therefore, that these elegant Grebes may have some real good reason for preening themselves so assiduously, though I hope this is not the case, and that it really is something more latter-day, after all.

FEB. 24TH.—In boat-house long before it was light, this morning, the ground being all covered, thick, with snow, which had fallen in the night—it commenced yesterday evening. The first birds to stir on the water, were the little Dabchicks, but the Coots that before had been so noisy and pugnacious, in the quite early morning, were now both silent and invisible, so that I left about 6-30, under the impression that they had really migrated from these waters, all, at least, except such as might have elected to stay and breed in them. On my return, however, about 8 o'clock, they were all upon the water again—at least there was no noticeable diminution.

Between 10 and 11, on the Wilston water, I twice saw sexualities proceeding between a pair of the Crested Grebes. On the first occasion this had to do with movements of the head and neck only, but I certainly could not describe them as a 'bout of shaking,' for they were always far more twitches than shakes that the birds gave, and always with that appearance, which I have before noticed, as of their being preliminary, merely, to something of real importance which was about to take place, but did not. There was, however, a much more noticeable—or perhaps I should rather say a more spectacular feature, unless it was novelty alone which made the difference—for the birds, time and again, instead of either shaking or twitching their heads, jerked them perpendicularly upwards, and, at the same time, opened and shut their mandibles, several times in succession. This was done with a moderate quickness, and as a part of the whole performance. One of the two distended them very widely, and kept them so, for a few seconds. The angle at which the mandibles then diverged from each other was such as to make them look like a pair of scissors, opened to their fullest extent. I do not know—for neither then nor at any other time have I been able to observe—what the colouring of the buccal cavity, in these Grebes, may be. If sufficiently salient, it seems possible that these actions may have reference to it, but it is the first time I have seen them.

A short time after this, the same pair gave me a specimen of what Huxley has called the 'ghostly Penguin' attitude, or 'ghost-dive,' on the part of the male—his *simple aveu* I thought it—and the 'cat,' or Halcyon one, on that of the female. The former dived, and I then noted that the female, who was turned away from me, had her wings

slightly extended, and that they were quivering. The male came up, not far away from her, and, after another dive, still closer. Then, diving again, he immediately rose, just beside her, standing upright, like a Penguin, almost, as it seemed, on the water. At that time, the wings of the female were more widely extended, and the pair presented the appearance shown in Huxley's very interesting sketch,* except, that it struck me that the sample was not a first quality one, but likely to be much more developed when the season was more advanced. After remaining in their respective poses for a few seconds, both the birds resumed their normal attitude on the water, and there was now a small outburst of head-twitchings between them. Here, again, they advanced their beaks towards each other, and seemed always on the point of nebbing or touching with them, which, however, they never did do.

There is now on the reservoir where I first watched from the boat-house, a regular flotilla of Dabchicks, which I make out, first, to consist of eleven, then of twelve, and lastly of fourteen, a separated pair having been overtaken by the main body. The head keeper also noticed fourteen, a day or two ago. Though they all went together, from the reedy corner by the boat-houses, to another part of the water, yet it was easy, first here, then there, now, and then again, to make out pairs of undoubtedly mated birds, which in a general way, were masked by their congregating. It is just the same with the Great Crested Grebe, and these two species show an essential similarity of general habits, with an entire absence, in the smaller and less adorned kind, of those curious displaying ones which distinguish the larger and handsomer. This certainly seems to indicate that development of display, and of the thing displayed, have gone together, the one arising out of and then reacting on the other.

FEB. 25TH.—To-day there was not a single Dabchick that I could see, where, yesterday, the little flotilla of fourteen was so conspicuous. On the whole of the water, not one appeared, and on the Wilston reservoir I only noticed two. This sudden disappearance is very striking, and seems to suggest that these birds have returned to the little creeks and inlets of their nesting days, though, for the matter of that, there is no part of the reeds here that does not seem a quite eligible situation.

A pair of Crested Grebes, on the Wilston water, nebbled, so far as I could make out with the glasses, several times. The bills appeared to coalesce, and the appertaining actions were distinctly those of mutual prehension, attended with

* *Loc. cit.*, plate 2, fig. 12.

mutual satisfaction. This bout of nebbing was not interrupted either by head-shakings or head-twitchings, and preening, whether nervous or otherwise, was also absent. The main object, which seemed clear and straightforward, was not, in this case, obscured, or interfered with. Another pair advanced, to meet one another, first with the neck outstretched on the water, in one straight line with the head and bill, as two birds proposing to fight would do. Then as they met, with but a foot or two, perhaps, of water between them, they raised themselves to a full, stretched height, bowed to each other, and then continued to bob or nod the head, this being first brought a little down, and then jerked upwards, so that the beak, for a moment or two, became 'star-y-pointing.' This was a fairly well-developed ceremony, yet with nothing that could be called head-shaking about it. I also noticed several times, a bird 'holding out its wings, to dry,' according to the question-begging phrase, as do Shags and Cormorants (both on land and in the sea), and there was one instance of bathing, in which the movements were so violent—one might almost say frantic—as to make it seem probable, as suggested by me before in the case of the Shag,* Red-throated Diver and other species, that an action, once of practical utility, has been impressed, in this one also, into the army of sexual antics.

MARCH 1ST.*—As the light was failing, I went out with the glasses, and saw first one, and then, a good while afterwards, four Dabchicks. These birds are not all gone, therefore, but it looks as though most of them had repaired to their nesting-sites, thus putting a stop to the congregating habit.

(*To be continued*).

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Part XXII. of *The Transactions of the Yorkshire Dialect Society* contains Essays on the Dialect of Upper Calderdale, 'The Felon Sewe of Rokeby,' the 'Riming Charter of Beverley,' etc.

The Report of the Warrington Museum Committee for the four years ending June 30th, 1920, has recently reached us. It contains a classified list of additions, and a portrait of the late Charles Madeley, director and librarian, 1874-1920.

The Sixty-ninth Report of the Marlborough College Natural History Society contains 46 pages of valuable records. These not only relate to flowering plants, birds, butterflies and moths, and the usual run of school records, but include Hemiptera, Diptera, Lichens, Rust-fungi and Plant-galls, Mosses, etc. There are valuable meteorological notes. The report is well printed and well edited.

* 'Bird Watching,' 1901, pp. 170-1; 'The Bird Watcher in the Shetlands,' 1905, pp. 199-201; 'Wild Life,' March, 1914, pp. 143-4.

* The intervening period was occupied in a 'bout' of illness, on my own part.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 180).

Clubiona reclusa Camb.

Widely distributed in the British Isles as far north as Moray Firth, Western and Central Europe; the commonest *Clubiona* in Yorkshire; amongst fallen leaves and low herbage, underwood and hedges. *Adult* in summer, some ♀s lingering on through the winter. First occurrence—the author, Slaithwaite, December, 1897.

V.C. 61, 62, 63, 64, generally distributed and common.

C. lutescens Westr.

Widely distributed in Ireland, and England as far north as Northumberland and Cumberland, but not yet reported from Scotland; abroad noted for many countries in W. and Central Europe, S. Russia and Sweden; common in Yorkshire; amongst low herbage, fallen leaves and grass and on bushes. *Adult* May to July, but ♀s linger on till winter. First occurrence—the author, Meltham, July, 1900.

V.C. 61.—Widely distributed, reported from all parts and common.

V.C. 62.—Plentiful, The Park (Middlesbrough), Nunthorpe, Grove Hill, N. Ormesby, J.W.H.; Forge Valley and Scarborough, T.S.; Upleatham.

V.C. 63.—Bingley district, Cottingley Wood, Hurst Wood (Shipley), W.P.W.; Bentley Springs (Wakefield); Askern; Deffer Wood (Cawthorn); Meltham; Drop Clough (Marsden), Woodsome (Huddersfield); Marsden Clough (Holmfirth); Denby Dale; Gunthwaite

V.C. 64.—Grassington, W.P.W.; Bishop Wood (Selby), Y.N.U.; Askham Bog and Chandler's Whin (York); plentiful, Wharfedale from Harewood to Thorparch; Adel; Washburn Valley.

V.C. 65.—Tanfield; Aysgarth, both sexes.

C. neglecta Camb.

Not common, but with a wide distribution in England and Wales and lately found near Forres, N.B., and in Clare Island, Ireland; abroad noted for countries in W., S.W., and Central Europe, and S. Russia. *Adult* from May to August, chiefly June and July. First occurrence—the author, E. Keswick, June, 1905.

V.C. 61.—Hornsea Mere, Spurn, both sexes, Bridlington 1 ♂, Welwick 2 ♀s; Kelsey Hill, ♂s, T.S., E.A.P.; Spurn.

V.C. 62.—Marske and Tees mouth, females.

V.C. 64.—East Keswick and Dalton Lane (Bramham), ♀s.

C. holosericea De Geer.

Widely distributed and usually common in the British Isles as far north as Aberdeen and St. Kilda, and on the Continent from Sweden to S. Russia; amongst herbage, reeds, etc., generally in the neighbourhood of water. *Adult* ♂ June to August. ♀ April to November. First occurrence—the author, Slaithwaite, June, 1900.

V.C. 61.—Widely distributed, and plentiful in marshy ground.

V.C. 62.—Beast Undercliff, Staintondale, T.S.; Scalby Mill; Coatham Marshes and Tees mouth.

V.C. 63.—Earby, F.R.; Loversal, H. V. Corbett; Bottoms Wood (Slaithwaite); Askern.

V.C. 64.—Gargrave, F.R.; Woodhall and Harewood Park, Y.N.U.; Chandler's Whin (York).

Clubiona pallidula Clerck.

Another common and widespread spider both at home (as far north as Aberdeen), and abroad from Sweden to S. Russia, of which there are few Yorkshire records; on bushes and sometimes in wall crevices and behind bark. *Adult* May to August. First occurrence—the author, E. Keswick, May, 1905.

V.C. 61.—Hornsea Mere, Y.N.U.; Deepdale Woods (Beverley) ♀, Bielsbeck, ♀, Sutton Drain ♀, T.S.; Kelsey Hill ♀, E.A.P.

V.C. 62.—Riftswood, Saltburn, ♀.

V.C. 63.—Keighley Moor ♀, R.B.; Askern, ♀s.

V.C. 64.—Saltaire Park ♀, W.P.W.; E. Keswick, ♂, ; Adel Moor ♀.

C. diversa Camb.

Widespread, but not often in quantity, in the British Isles as far north as Moray; abroad, France, Germany, Austria, Hungary; at the roots of grass and heather, occasionally beneath stones. *Adult* in summer and autumn. First occurrence—the author, Drop Clough, May, 1900.

V.C. 61.—Skipwith, Snake Hall, Sandholm, Brantingham Dale, ♀s, T.S.

V.C. 62.—Eston, several examples, Redcar, Greenhow Botton, Lonsdale, J.W.H.; Ringingkeld Bog and Staintondale, R.A.T.; Eston, 2 adults of each sex.

V.C. 63.—Bingley Woods, R.B., W.P.W.; woods at Shipley and Cottingley, W.P.W.; in the Huddersfield district at Cupwith, Owlter's Wood, Ainley Place, Wilberlee, Dean Head, Drop Clough, Wessenden Valley, Meltham, Horn Hill (New Mill), Spring Wood (Netherton), Honley Old Wood, Butternab Wood, Crosland Moor, Lepton Common, but sparsely; Chew Valley, Greenfield; Coxley Valley, Dewsbury.

V.C. 64.—Giggleswick Scar, W.P.W.; Sawley High Moor; Bolton Woods; Kingsdale (Ingletton); Adel; Alwoodley Gates; Linton Common; Stubbing Moor.

C. trivialis L. Koch.

Not uncommon in Scotland and the N. of England, but much rarer farther south and in Ireland; abroad noted for N. and Central Europe, rare in France; more numerous in Yorkshire than the last-named species; among heather and Empetrum. *Adult* May to September. First occurrence—the author, Slaithwaite, September, 1900.

V.C. 61.—Bielsbeck, Market Weighton, T.S.; Skipwith Common.

V.C. 62.—Eston, Lonsdale, Normanby Intake plantation, Wilton Wood, J.W.H.; South Cliff, Scarborough, R.A.T.; Ringingkeld Bog; Goathland, Boosbeck, Kilton Woods.

V.C. 63.—Harden, W.P.W.; Wilsden, R.B.; many localities in the Slaithwaite, Marsden and Meltham districts; Wilshaw; Crosland Moor, Butternab Wood, Storthes Hall Wood, Lepton Common, in the Huddersfield district; Norland Moor, Halifax; Hebden Bridge; Deffer Wood (Cawthorn).

V.C. 64.—Sawley High Moor, S.M., W.F.; Adel Moor; Moor Allerton; Burley-in-Wharfedale.

C. brevipes Bl.

A woodland spider beaten from the lower branches of trees, especially oaks, and usually common; widely distributed in Britain as far north as Edinburgh, rarer in Ireland; abroad occurs in Sweden, Channel Islands, France and Central Europe. *Adult* May to June. First occurrence—the author, Askern, June, 1908.

V.C. 62.—Kildale, beaten from alders, J.W.H., G.B.W.

V.C. 63.—Askern, several of both sexes; Bentley Springs, Flockton, near Wakefield, 3 ♂s beaten from bracken.

V.C. 64.—Harewood Park, beneath tree bark, ♀, W.P.W.; Bishop Wood (Selby), ♀, T.S.

Clubiona subtilis L. Koch.

Widespread and not uncommon in the south of England; recorded also for Wicken Fen (plentiful), Yarmouth, Staffordshire, and near Edinburgh, 1 ♀; not yet noted for Ireland. *Adult* May to August. First occurrence—T. Stainforth, Spurn, May, 1908.

V.C. 61.—Spurn, T.S., E.A.P.; all over the headland, abundant, and one mile nearer Skeffling, W.F.; Welwick shore, 2 ♀s, T.S.

C. comta C. L. Koch.

This and the next have a distinct abdominal pattern, which is wanting in the other British *Clubionae*; common amongst fallen leaves or low growing vegetation, especially in woods; with a wide distribution in the British Isles as far north as Moray Firth and on the Continent in the N., W. and Central countries. *Adult* April to June, but ♀s may be found later. First record—Rev. O. Pickard Cambridge, near Bradford, October, 1857. *Zoologist*, 1859, p. 6497.

V.C. 61.—N. Cave, Weedley Springs, beech wood at S. Cave, Market Weighton, Y.N.U., Houghton Woods, Birkhill Wood (Cottingham), Ripplingham, T.S.; Skipwith Common.

V.C. 62.—Wilton Woods, Eston Moor, Marton, very common amongst grass, J.W.H.; Falling Foss and Little Beck, W.P.W.; Langdale End and Hayburn Wyke, T.S.; Scarborough Mere; Raincliffe Woods; Kilton Woods; Riftswood (Saltburn).

V.C. 63 and 64.—The species has occurred in every locality where investigation has been made and stations are numerous in all parts.

C. corticalis Walck.

Somewhat local in distribution, of southerly range, and not yet noted for either Scotland or Ireland; often abundant where found; beneath the bark of trees. *Adult* June and July. First occurrence—the author, E. Keswick, June, 1903.

V.C. 62.—Kirby Moorside, one of each sex, T.S.

V.C. 63.—Cusworth (Doncaster) 2 imm. ♂s, T.S.; Cannon Hall Park, beneath bark of Sycamores near the ponds, two of each sex, W.P.W., W.F.

V.C. 64.—E. Keswick, rosemary bush in garden of Argyle House, 1 adult ♀.

C. facilis Camb.

A unique female, described and figured by the Rev. O. Pickard Cambridge in the Proc. Dorset F. Club, 1910, Vol. XXXI., p. 68, plate A., figs. 1-3, probably an exotic.

V.C. 64.—Marton, near Gargrave, 'from a wall on the bank of the Leeds and Liverpool Canal, at a point where there is no landing for a considerable distance nor is cargo discharged anywhere near.'—F.R., July, 1909.

Gen. *Anyphaena* Sund., 1-1.

A. accentuata Walck.

Widely distributed in the British Isles as far north as Perthshire and on the Continent, W. and Central Europe, N. Italy and Sweden; usually much more abundant in the immature form than the adult; beaten from bushes and the lower branches of trees. *Adult* April to September. First occurrence—the author, Dalton Lane, Bramham, May, 1903. Rare in Yorkshire.

V.C. 61.—Hessle Cliffs, H.C.D. (H.M.P.).

V.C. 62.—Kildale Woods, adult female from alder, J.W.H.; Hayburn Wyke, T.S.

V.C. 64.—Dalton Lane, abundant but immature; Spa Gill, Sawley, an adult ♂.

Gen. *Zora* C. L. Koch, 1-3.

Z. spinimana Sund. (*maculata* Bl.).

Widely distributed in the British Isles and on the Continent; also in Syria, S. Russia, N. Africa and the United States; and usually common amongst grass and herbage. *Adult* throughout the year. First occurrence—the author, Butternab Wood, September, 1900.

V.C. 61.—Bielsbeck, adult and imm. ♂s and ♀s, Houghton Woods (Market Weighton), both sexes, common; Kilnsea, T.S.; Skipwith and Riccall Commons.

V.C. 62.—Ravenscar; Hayburn Wyke; Levisham; Kilton Woods.

V.C. 63.—Woodsome, Butternab Wood, Smith's Wood and Storthes Hall Wood (Huddersfield); Lower Stones Wood (Stockmoor); Ellen Springs, Shepley; Askern; Deffer Wood (Cawthorn).

V.C. 64.—Grassington, W.P.W.; King Wood and Adel Moor; Rigton (East Keswick); Linton Common; Washburn Valley; Spa Gill Bottoms (Sawley); Hackfall; Ingleton.

Gen. *Agroeca* Westr., 2-7.

A. brunnea Bl.

Not a common spider though on record for several localities in England as far north as Cumberland and Northumberland; chiefly amongst heather, especially in clearings in woods; absent from Scotland and Ireland, but occurring abroad in several of the western countries of Europe and S. Russia. *Adult* August, September and October. First occurrence—J. W. H. Harrison, Eston, October, 1909.

V.C. 62.—Eston, imm. July, an adult ♂ October; 'thinly distributed over all the Cleveland moors, J.W.H.'

V.C. 63.—Storthes Hall Wood, Huddersfield, an adult ♀.

A. proxima Camb.

Widely distributed and fairly common in the British Isles as far north as Oban and in the Isle of Man; abroad also in France, but rare in Austria; amongst grass and low vegetation. *Adult* late summer and autumn. First occurrence—the author, Stubbing Moor, Leeds, 1903.

V.C. 61.—Spurn, 3 ♂s, Kilnsea, Kelsey Hill, Bielsbeck, 1 ♀, Snake Hall Moor, Houghton Woods (Market Weighton), both sexes, Skipwith Common and Allerthorpe Common, males, T.S.

V.C. 62.—Thornton Dale, R.A.T.; Marske, at roots of herbage on low cliffs near the Cemetery, and Tees mouth, several adult and imm. ♂s and ♀s.

V.C. 63.—Deffer Wood (Cawthorn); Joy Wood, Storthes Hall.

V.C. 64.—Guisburn, ♀, F.R.; Newby Cote (Ingleborough) 1 ♀; Linton Common and Stubbing Moor, near Leeds, 2 ♂s, 2 ♀s.

(To be continued.)

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Mr. H. Rowland-Brown has succeeded the Rev. G. Wheeler as Hon. Secretary of the Entomological Society of London.

Cionus woodi, a species of coleoptera new to science, from Windermere, is described by H. Donisthorpe in *The Entomologist's Record* for April.

Part XXVI. of Buckman's *Type Ammonites* contains figures of *A. crassiusculus*, *A. incrassatus*, and *A. crassulus*, from the Whitby Lias; *A. alligatus* from the Kelloway Rock, Scarborough, *A. huntoni* and *A. robinsoni* from the lias of Robin Hood's Bay, as well as others from various localities.

THE CONGLOMERATES UNDERLYING THE CARBONIFEROUS LIMESTONE IN THE N.W. OF ENGLAND.

J. A. BUTTERFIELD, M.SC., F.G.S.

(*Continued from p. 172*).

(3).—THE LUNE, REDGILL, ELLERGILL BECK AND LANGDALE BECK.

These becks are chiefly interesting in showing the extension of the red sandstones in the eastern part of this area.

(a) *The Lune*. In the bed of the Lune under Tebay Bridge red sandstones are well displayed, and can be traced for some distance down stream, though they eventually become hidden by river deposit. Upstream there are no exposures until about 50 yards above the ford leading to Coalflatt Hall, when they again form the bed of the river. The sandstones here are well jointed, but the dip is only obtained with difficulty. It conforms, however, with the dips in other parts. Higher up the river the sandstones run out, but the exact point cannot be found owing to the large accumulation of pebbles, etc., from the boulder clay forming the banks at this point. One very interesting observation was, however, made a little higher upstream, for in the river bank, close to Raisgill Hall Bridge, a dark-brown sandy rock was found, overlain by about 4 feet of purple and blue mottled shaly sandstone, and finally overlain by a brown sandy limestone. Thirty yards below the bridge the above purple and blue mottled sandstone forms the bed of the river, and in the quarry to the north-west of Raisgill Hall the dun-coloured limestone is exposed dipping 10° N. 25° E. Here, therefore, is proof of the extension of the beds at the top of Micklegill Beck and Chapel Beck, for this dark sandy rock exposed here is no doubt the same as that recorded previously in these notes as a mudstone. The Lune beyond this yielded no further exposures.

(b) *Redgill*. Just above the farm, on the left hand side going up, there is an exposure of red sandstones well bedded, but not sufficiently exposed to obtain reliable dip. A hundred yards or so above the farm is a second exposure and still a third higher up again. All these three exposures are of sandstone. In the beck above Gaisgill Row a similar exposure of red sandstone occurs about 100 yards above the farm, and the reading of dip obtained here was 8° N. 10° E. The beck above Gaisgill gives similar evidence. The name Redgill is very fitting for any of these gills, for they are veritable red gills with their steep banks of deep red incoherent sands.

(c) *Ellergill Beck*. Entering in at the top of Ellergill Beck, the Silurian rocks are well exposed, dipping very steeply south and making well-marked gorges in the plantation south-east of Gill Hole. At the point in the beck directly north-east of Gill Hole the junction is displayed and the unconformity can be well seen. The Silurian rocks are overlain first by about one foot of red sandstone, and then by fairly coarse conglomerate, several feet in thickness, the pebbles in which average 3 in. across. Further downstream these conglomerates are overlain by red sandstones dipping lightly N. 10° E. These sandstones form the bed of the stream, save for two bands of conglomerate as marked on map, until below the farm the exposures are hidden by stream deposits of pebbles. In this beck, therefore, the sandstones contain interbedded bands of conglomerate, some of appreciable thickness.

An interesting study in this beck is the nature of the junction between the Silurian rocks and the overlying red beds. The surface of the slates is not smooth, but jagged, as roughly broken slates would be, and the red deposits have filled in every little corner. The slates are stained red for some distance inwards, and the rock material at the junction is a petrological study in itself. It cannot be dealt with at this stage.

(d) *Langdale Beck*. Under the small bridge by the village red sandstones are exposed dipping 10° N. 15° E., and at a point about 300 yards above this bridge the junction with the Silurian rocks is well marked. They are here overlain by about five feet of fairly coarse conglomerate. From this point to the bridge above mentioned red sandstones are well displayed with a few interbedded bands of red conglomerate.

It seems, therefore, that towards the east, bands of conglomerate intrude in the sandstones, but it would not be safe to say that these conglomerate bands are absent from the three small gills west of Ellergill Beck. The exposures in these becks are too few to make such a generalisation.

It is desirable to emphasise three points—(1) the case of the probable local unconformity of the green series in the red in Birk Beck; (2) the natural passage from the red beds into the limestone shown in Micklegill Beck and Chapel Beck; and (3) the greater development of red sandstones in this area than in the Sedbergh area. The first point is quite natural in such deposits. It seems that they must have been in the first place flood deposits, such as are laid down in certain semi-desert regions of the earth in periods of torrential rains at the present time. These deposits, washed down from the hillsides, have then been redistributed to a certain extent, probably by river agency, possibly in some cases by sea, and the component pebbles have at this stage become rounded.

A subsequent period of drought would leave these deposits dry, and any local flood afterwards would cut a gully through them and fill it in with local material, the whole being covered again in time of universal heavy rains. Evidence of such desert conditions occurs in the beautiful rounding of many of the sand grains, especially noticeable in the red sandstones of Blind Beck, and in the three foot conglomerate band of Nor Gill, Sedbergh. The red colour, too, suggests desert conditions.

The second point brings up the question of the age of these beds and also what is to be regarded as the Basement Conglomerates. This latter can only be settled when the whole area is considered, but at present, for the purposes of this work, all the conglomerates and sandstones overlying the Silurian and older rocks up to the first limestone beds of the Carboniferous Limestone are being included. The colour seems to be no criterion, and is probably only caused by small differences of physical conditions during deposition.

Further east, in Pinskey Gill, there is an interesting suite of rocks, described by Garwood and others, which will be dealt with in a later communication. The beds described above seem to be cut off by a fault on the east as marked on the map, and this will be taken as the bounding line for the present account, as also must the small local faults in Stakely Beck form the bounding line in the north-west.



A new fungus, containing a deadly poison, has been discovered in Germany. Owing to the scarcity of foods the habit of using champignons and wild plants as food has much increased. In 1917 a person died after a meal of mushrooms, at Aschersleben. It was not possible at that time to identify the species. Quite a number of similar accidents happened in 1919 and 1920. At last Dr. Ricken, with the assistance of the botanist Ert Soehner, Munich, identified the fungus as a hitherto unknown variety, *Inocybe lateraria* Ricken. The *Pilz-und Kräuterfreund*, a scientific periodical published by an association of mycologists and botanists, contains a coloured plate showing the fungus in its various phases of development, with descriptions.

Among the reprints recently issued by the Smithsonian Institution are:—'Paleobotany, A Sketch of the Origin and Evolution of Floras,' by E. W. Berry; 'Sphagnum Moss: War Substitute for Cotton in Absorbent Surgical Dressings,' by G. E. Nichols; 'A Pleistocene Cave Deposit of Western Maryland,' by J. W. Gidley; 'Sexual Selection and Bird Song,' by C. J. Hawkins; 'The Psychic Life of Insects,' by E. L. Bouvier; 'The Fundamental Factor of Insect Evolution,' by S. S. Chetverikov; 'The Direct Action of Environment and Evolution,' by Prince Kropotkin; 'Marine Camoufleurs and their Camouflage; 'The Present and Prospective Significance of Facts regarding the Coloration of Tropical Fishes,' by W. H. Longley; 'Reptile Reconstructions in the United States National Museum,' by C. W. Gilmore, and 'On the Law of Reversible Evolution,' by B. Petronievics.

A NEW SECTION NEAR BRANTINGHAMTHORPE, YORKSHIRE.

JOHN PRINGLE, F.G.S.

SOME specimens obtained from a small opening recently made by Sir John Sherburn in a field between Ellerker and Brantinghamthorpe were submitted to me by Mr. T. Sheppard for examination. The excavation, which is situated not far from the words 'trial shaft' engraved on Sheet 86 of the one-inch Geological Map, showed the following details:—

Sand and gravel with fragments of Liassic and Chalk rocks	... ..	3 to 4 ft.
Stiff blue clay [Upper Lias]	... ..	6
Dark grey shale with seams of brown ferruginous oolite and pellets of bluish-green ironstone. Iron-pyrites fairly abundant in matrix. [Middle Lias]	... ..	seen $\frac{1}{2}$

The specimens of blue clay contained no fossils, but the bed is probably of Upper Lias age, and comparable with a portion of the blue shale with nodules of cement stone passed through in the shaft made at a point where the footpath to Ellerker crosses Moor Lane.* This view is further strengthened by the fact that the underlying dark grey indurated shale with seams of brown-weathering ferruginous oolite clearly belongs to the Marlstone, since it yields the following shells, *Pecten* (*Pseudopecten*) *aequivalvis* J. Sow., *Protocardia truncata* (J. de C. Sow.), and *Belemnites* cf. *breviformis* Voltz. These fossils are characteristic of the *Pecten* and Main ironstone seams of the Cleveland district.

Several of the rock-samples of the Marlstone have a curious cellular aspect apparently resulting from the partial solution of the grains of oolite, and it is not surprising that further progress with the excavation was prevented by a copious inflow of water.

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The Journal of Roman Studies (Vol. IX., Pt. 1) contains 'Verro's Aviary at Casinum,' by A. W. Van Buren and R. M. Kennedy.

We learn that the Leicester Museum and Art Gallery is to be closed two days a week, and that every night branch library is to be closed until further notice, in view of the present restricted incomes of these excellent Institutions. As Leicester is probably the only important place in the whole country where such drastic steps have to be taken, it seems an unfortunate coincidence that the president of the Museums Association, who is the chief librarian in that city, should have charge of the Museum and Art Gallery.

* C. Fox Strangways. *Jurassic Rocks of Yorkshire* (*Mem. Geol. Surv.*), 1892, p. 144.

FURTHER OBSERVATIONS ON THE OCCURRENCE OF MANGANESE IN LAND AND FRESH-WATER MOLLUSCA.

A. E. BOYCOTT.

(Continued from page 138).

Similarly there is a certain amount of evidence that *Limax tenellus*, the other species of this group which gives uniformly high results, is generally, but not always, found in specially manganiferous places :—

		General Average.	Wyre Forest Oak.	New Forest. Oak.	Hampden, Bucks. Beech.	Branscombe Devon. Oak mixed.
<i>Limax tenellus</i>	...	94	41	91	78	137
<i>L. maximus</i>	...	13	—	21	56	—
<i>L. cinereoniger</i>	...	48	—	107	86	85
<i>L. arborum</i>	...	58	46	—	270	96
<i>Arion ater</i>	...	31	—	78	47	364
<i>A. subfuscus</i>	...	54	—	72	274	292

The circumstances of these two species, which characteristically, especially *L. tenellus*, live in woods, suggest that there may, after all, be some connexion between their occurrence and the prevalence of available manganese. Looking through the data for the whole of the variable group D (slugs and *Hyalinia*), it is certainly curious that (1) all the high figures have been found in specimens from wild places, and never in those from loci which have come well under the influence of civilisation; (2) nearly all the figures from cultivated areas are low; (3) some woods give low figures, but in no case can those be exempted from a suspicion of being modern plantation, at least these are the facts as far as I know the habitats in detail; material received from other collectors is in some instances not sufficiently localised. Thus in the series of *Arion ater* from 30 different localities, the 8 which are above the mean (31) are from a beech wood in Buckinghamshire (47), a wood in Cork (50), a wood near Nottingham (36), an oak wood at Llanberis (55), a mixed oak wood in Devon (364), an ash wood in Devon (40), a beech wood in Wiltshire (121), and the New Forest (78); from gardens, fields, and hedge banks in Herefordshire, Wiltshire, Devonshire, Down and Buckinghamshire there are eleven ranging from less than 1 to 6. Similarly with *Limax arborum*, the highest figures (96-232) come from woods and from a sea-cliff in North Devon,

the lowest from a garden in Ireland (6), and from eight different beech plantations in South Wiltshire (under 1 to 13). It is suggestive also that the ten analyses of that domesticated slug *Limax flavus* all give less than 6 except one from Cork (36) which is the only example from a wild place that I have examined, and that *Testacella*, *Agriolimax agrestis*, *Amalia sowerbyi* and *A. gagates*, which are fond of cultivation and civilisation, all give low figures. *Limax cinereoniger*, which is markedly anthropophobic, has given no result less than 14.

If these indications of a connection between old woods and abundance of manganese represent any reality, a number of possible explanations suggest themselves, of which two are worth mention. (a) Many places are uncultivated because they are uncultivable; possibly an excess of manganese in the soil is the cause of this. (b) Trees may collect manganese from the soil, and it then accumulates in the humus—on the whole I think the most likely explanation. I do not suppose that there is a direct connection between any mollusc and the content of any place in manganese; the association, such as it is, is indirect *via* the soil or vegetation.

The most richly manganiferous place which I have met with is Blackberry Castle, a mixed beech-oak-birch-sycamore (originally, I expect, oak) wood on a sad, gravelly soil of 'clay with flints' overlaying the greensand four miles north-west of Seaton, in Devon. The results are as follows, the general average for each species being given in brackets:—*Limax cinereoniger* 85 (46), *L. tenellus* 137 (87), *L. arborum* 96 (57), *Hyalinia cellaria* 77 (21), *H. helvetica* 133 (24), *H. alliaria* 145 (36), *H. nitidula* 199 (35), *Arion ater* 364 (31), *A. subfuscus* 292 (58), *A. hortensis* 228 (29), *A. circumscriptus* 113 (12), *A. minimus* 162 (44), *Pyramidula rotundata* 4 (2). Contrast with this Tower Hill Wood, a beech wood largely and perhaps entirely a modern plantation on the chalk downs two miles west of Boscombe, in south-east Wiltshire: *Limax maximus* 2 (13), *L. arborum* 2, *H. cellaria* 11, *Arion subfuscus* 2, *A. hortensis* 3, *A. circumscriptus* 5, *Agriolimax agrestis* 4 (9), *Hygromia rufescens* 1 (0.4), *Helix nemoralis* 1 (1), *H. hortensis* 1 (1), *Buliminus obscurus* 56 (61).

The species which live in wet places by the sides of rivers, etc., *Agriolimax laevis*, *Zonitoides nitidus*, *Ashfordia granulata*, *Succinea putris* and *S. elegans*, seem to separate themselves out as a habitat, rather than a systematic, group of rather low manganese content. I have already noted that *Hyalinia cellaria*, *Hy. helvetica* and *Hy. nitidula* from such places give results much below the average.

Among the species which were not included in my previous paper, *Margaritana margaritifera* is of interest. Living in soft-water rivers in the west and north, it falls in line with the

other large bivalves, which affect quite different habitats, in having a high manganese content, and indeed on the average considerably exceeds *Unio* and *Anodonta*. Specimens from the Wye at Hereford gave 152 and 131, from Glengariff, in Cork, 151 and 212, from the Taw, in Devon, 103, and from the Irt, in Cumberland 38, mean 116. *Limnaea peregra* from the Taw had 9 (average 4), and the slime of algae on the stones had accumulated even more than the mussels, giving 369. But manganiferous surroundings by no means result in a snail having much : thus the bodies of *Dreissena polymorpha* from the canal at Agbrigg gave 2 and their black encrusted byssus as much as 610 ; a similar comparison on specimens from Wakefield showed 4 and 342.

Analyses of *plants* are too few for more than brief notice. Water plants (max. 77 in *Ranunculus aquatilis*), algae (max. 369), liverworts (*Riccia fluitans* 236), and mosses (max. 890 in *Eurhynchium rusciforme*) have on the whole much more than land plants. Among the latter the leaves of trees and mosses have most (beech up to 26, *Thuidium tamariscinum* 10), herbs, fungi, and lichens very little (generally 1 or less), liverworts rather more. They doubtless vary widely with the locality.

The *shells* of the mollusca have not been examined in detail. Those of *Buliminus montanus*, *Zonitoides excavatus* and *Unio pictorum* show only traces. The encrusting deposit on *Limnaea* and other water shells may contain considerable quantities.

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The Tunbridge Wells Literary Society has issued a four-page pamphlet which contains an account of the annual meeting, and of the Rev. T. R. R. Stebbing's Presidential Address.

The Bristol Museum and Art Gallery has issued its report for the year ending September, 1920, this being the hundredth year of the Institution's existence. We should like to congratulate our Bristol friends on their excellent work during a century.

Among the contents of the *Belfast Natural History and Philosophical Society's Report* recently received, we notice 'North of Ireland during the Glacial Period,' by Dr. Derryhouse, and several papers of more general interest, which do not, however, bear much upon the district.

The *Proceedings of the Croydon Naturalist History and Scientific Society* contain the Presidential Address of Mr. A. F. Major on 'Surrey, London, and the Saxon Conquest,' as well as 'The Home Life of Badgers,' by Miss L. E. Cheesman, and 'Report of the Meteorological Committee, 1919,' prepared by Mr. F. Campbell-Bayard. The last item is a remarkably complete record.

The four parts of the *Journal of the Northants Natural History Society and Field Club*, for 1920, have recently been received. Among the contents are a series of well-illustrated papers on 'The River System of Northamptonshire,' by B. Thompson ; 'A New Northamptonshire Member of the Characeae,' by H. N. Dixon ; '*Rosa Litigiosa* in Northants,' by G. C. Bruce, and various shorter notes and observations dealing with History, Conchology, Botany, Meteorology, etc.

FIELD NOTES.

Isolated Nests of Rooks.—In recent years I have noticed a great tendency among rooks for individual pairs of birds to construct nests in isolated trees, a good distance away from a rookery. This habit I have observed practically all over the county. There are also large numbers of new rookeries, many of them in populous and busy neighbourhoods. Correspondingly many of the older rookeries have decreased in numbers, and in some cases have been abandoned altogether. Is the raiding to which many of them were subjected during the war responsible for this? It would be interesting to have reports from the various parts of the county as to whether rooks have decreased or otherwise in the old rookeries, and how many new ones have been established.—R. FORTUNE.

Hygrobia (Pelobius) tarda Herbst., etc., near Hull.—Among the water beetles I captured in a pond on the Humber shore, at Paull, on April 25th, was a specimen of *Hygrobia tarda*, the 'Screech' or 'Squeaker' Beetle. As far as I am aware it is more than twenty-eight years ago since the last Yorkshire examples were taken. This happened on the occasion of a Yorkshire Naturalists' Union excursion to Withernsea, on August 1st, 1892, when Mr. W. H. Baker found it plentifully in stagnant ponds to the north of that place. Induced by this record, I have frequently sought for the species in the Hull district, but hitherto without success. On May 1st, Mr. E. Bilton captured another specimen in the same pond at Paull. This insect was added to the Lincolnshire list in 1908, examples being taken at Aylesbury and Humberstone. The beetle is interesting not only on account of its power of loud stridulation, but also for its somewhat aberrant position among water beetles proper. Houlbert states the case very well in 'Les Coléoptères d'Europe,' Tome I., p. 292, where he writes that 'le genre *Hygrobia* peut être considéré comme l'un des moins spécialisés parmi les Hydrocanthares; c'est, en somme, une sorte de Carabique incomplètement adapté au milieu aquatique et chez lequel le facies dytiscidien n'est encore qu'incomplètement exprimé.' It may be of interest to record further captures; on May 1st, of seven or eight examples of *Dytiscus circumflexus* F., in a pond on the Humber shore near Cherry Cob Sands. This is more easterly than its previously recorded localities of last year. I am of opinion that *circumflexus* will prove to be the characteristic *Dytiscus* of the Humber littoral. Wherever it occurs it seems, as a rule, to outnumber both the *marginalis* and *punctulatus* which may be associated with it. It is almost certain that it will be found in ponds on the south shore of the Humber, for it occurs in Norfolk, and a search for it should be made by our Lincolnshire friends.—T. STAINFORTH, Hull.

YORKSHIRE NATURALISTS AT SOUTH CAVE.

CHARACTERISTIC of our English weather are its surprises. One hardly expected such a pleasant one, however, as favoured the end-of-March Easter Meeting of the Yorkshire Naturalists' Union at South Cave. The meteorological conditions fairly took the wind out of the sails of those who, with just cause, are pressing for a fixed Easter holiday to fall later than in the present year. In spite of the early date and the absence of cheap railway facilities, both the Saturday and Monday meetings were well attended; the Hull societies, as was to be expected in this locality, being chiefly represented.

Headquarters were at 'The Bear' Hotel, South Cave, where a few members, having the advantage of the company of the President, Mr. H. B. Booth, stayed for the week-end. The district is undoubtedly the most interesting to be found in proximity to Hull. In geology especially it affords the variety that gives spice.

Excellent reports of the meetings appeared in *The Yorkshire Post*, use of which has been made in the following general account.

The members assembled at midday on the Saturday, at North Ferriby, the geologists under the leadership of Mr. W. S. Bisat, and the rest of the naturalists under the direction of Mr. T. Stainforth. For the first stage of the walk all were willing to be geologists, and Mr. Bisat led the party to the foreshore of the Humber, and for a mile or two upstream. Here the moraine of the North Sea ice-sheet has been recognised. Before the Ice Age East Yorkshire presented to the sea a line of chalk cliffs stretching round from Sewerby, near Flamborough Head, through the hills overlooking Beverley, and to the Humber at Hessle. Against these cliffs the great glaciers filling the basin of the North Sea abutted and piled up the spacious expanse of debris which now constitutes Holderness. But in the mouth of the Humber there was no such obstacle, and the ice was free to push far up the estuary. The southern end of the moraine which marked the extent of the trespass of this lobe of ice, has long been known on the Lincolnshire shore at South Ferriby. It afforded the Romans an elevated site for their station. For a few hundred yards the Yorkshire bank, and consequently the foreshore, presents a most remarkable museum of hard rocks of every sort and kind—from northern England and southern Scotland—lias with fine ammonites from Whitby, mountain limestone and basalt from Teesdale, and the easily recognised granites of Shap and the Lake District, the lavas and ashes of the old volcanoes of the Cheviots, granites, schists and jaspers from South Scotland, and mixed haphazard with all these British rocks, pebbles of characteristic Norwegian origin.

Leaving the Humber the party struck into a little narrow belt of woodland which zig-zags for half-a-dozen miles from the shore. This woodland is in summer a delightful place for wild plants, and even, early as it was, the visit could not be regarded as altogether without reward.

About a mile and a half from the shore the party made its way to a spot where new works are being erected to produce Portland cement. Here, well in the Wold country, the Middle Chalk will be excavated. Huge machine excavators, which have seen service in France, are already on the ground. In the big works, which are in course of erection, the material will be reduced to a liquid 'slurry', and it will then flow along a pipe line to companion works at the Humber side for the completion of the process. Remembering the advantages with which Portland cement is credited over ordinary limestone cement for certain classes of work, it is curious that that advantage is founded upon, not exceptional purity, but the actual reverse. The Yorkshire limestones and chalk are purity itself, and will make a cement with the best, but Portland has a muddy limestone, far less pure, which in actual practice is found to possess a peculiar chemical reaction.

On the arrival of the chalk 'slurry' at the Humber works it will be mixed with liquid clay in the right proportions, and other necessary ingredients, the result filtered out, dried, and fired, and 'Portland cement' is the result.

The works, besides their industrial interest, have a scientific importance, since they have revealed the presence in the district of strata never previously recorded.

On the Sunday, the members who were staying the week-end, spent the morning, by special permission, in the grounds and gardens of Cave Castle, a pleasant old house, which commands a magnificent view across the Humber and up the Vale of Trent. The house is at present unoccupied, and consequently some parts of the grounds have been suffered to develop a little more freedom, and to the botanist a little more charm than the gardener will commonly permit. Thus one was able to see with something of the appearance of Nature's handiwork choice foreign species growing luxuriantly and without formality—masses of a sky-blue anemone—the Appenine species or something akin; *Scillas* and *Chionodoxas* of the richest colours, *Primulas* in great variety, in jungles of glowing *Forsythia*. There was still much beauty in the scores of square yards of the little winter aconite—a native, no doubt, in this locality, and one of which the gardeners have had the good taste to make much.

In the afternoon the party walked across the park, and an extensive expanse of level country, to one of the attractive recesses in the Wolds. Drewtondale, that selected for the visit, is one of many deeply-cut clefts which open suddenly in the side of the rounded chalk hills. It is filled with woodland, but it is perhaps best known in the district from the occurrence at its head of a huge mass of natural concrete of chalk and flint, standing like a castle on high, and commanding a very impressive view. This is known as St. Austin's Stone.

The botany of the dale was interesting, and had special distinction in providing the deadly nightshade, the monkshood—in conditions which allows one to think it native and not introduced from a garden—and delightful patches of sweet white violets.

On Easter Monday a large number of naturalists from Hull and a few from the West Riding assembled at Brough railway station, and walked to South Cave station, where a visit was made to a remarkable quarry opened near the goods sidings of the station. Forty years ago when the railway cutting was made the section displayed was sufficiently curious to provoke Mr. F. F. Walton, of Hull, who was the leader of the party for the day, to make a sketch in his note-book. Two years ago a quarry was opened to work what at that time appeared to be a solid mass of hard limestone—the Millepore Limestone. The work had not gone very far when it was found that a mere screen of limestone concealed very fine white sand of high value for glass-making, and as this was eagerly excavated, the section developed a most puzzling complexity, for great masses many yards in length of the limestone were found overlying glacial deposits much less ancient than the limestones themselves, and involved in the confusion was an old land surface with rootlets and rolled masses of estuarine material of Oolitic age. The spot has attracted many geologists during the last year or so, and it is now concluded with fair certainty that the phenomena can only be explained as due to disturbance by a glacier, which has torn off and thrust forward a mass of limestone overlying the less ancient deposits. A special interest lies in the fact that if this is glacial work, as doubtless it is, it must belong to a stage of the Ice Age of which little is known, since most of the evidence was swept away by later phases of glaciation. Evidently the thrust was in the direction of the Humber, and if ice could find a way to the sea through the Humber, it must have been quite early in glacial history, for the Humber was very soon closed by the ice-sheet, the moraine of which was examined on the Saturday excursion.

In the afternoon another of the chalk dales—Weedley Springs—was examined, and subsequently a general meeting for the comparison of results was held at the Bull Inn, South Cave, under the presidency of Mr. Booth. A score of new members was elected.

GEOLOGY.—Mr. W. S. Bisat sends the following notes on the geological section examined at North Ferriby and Melton on the Saturday :—

The party assembled at Ferriby Station, and walking to the foreshore, examined the exposures of the Red Cliff moraine. This section was described many years ago by Mr. J. W. Stather (*Proc. Yorks. Geol. Soc.*, Vol. XIII., pt. 2, pp. 210-220), but lately the erosion of coast defences has shewn that the boulder clay extends eastward as far as Ferriby landing. Attention was drawn to the effect of the descent of root fibres into the black laminated clays. These clays are washed by spring tides, and interesting differential erosion takes place. Each root fibre is surrounded by a small cylinder of altered clay, and this cylinder is more resistant than the untapped clay surrounding it, and consequently stands out as a small pinnacle. The effect is enhanced by the colour, which is changed from black to yellow. The similarity to marks in estuarine rocks of earlier ages was noted.

Interesting sections in present-day Humber warps were seen, and there was a marked scarcity, during the visit, of Norwegian rocks from the boulder-clays.

A walk through Long Plantation brought the party to the new quarries at Melton Bottoms, where, by the kind permission of the Humber Portland Cement Co., Ltd., examination was made of the various sections and spoil tips.

Sections in the Middle Chalk and Lower Chalk were examined, the beds near the level of the Black Band proving very fossiliferous. A spoil tip of Red Chalk yielded the three characteristic belemnites, and also specimens of the underlying Carstone, with polished pebbles.

A large tip of sub-Cretaceous clays, which has yielded fossils of Corallian age, was examined; but the clays were too weathered to enable anything more than fragmentary specimens of ammonites, belemnites, oysters and small gastropods to be obtained.

FLOWERING PLANTS.—Observations of the flowering plants were made by Messrs. H. E. Wroot, J. F. Musham and others. Of chief interest was the abundance of early spring flowers to be seen in all parts of the district. These reflected clearly the exceptional mildness of the weeks preceding Easter. In plantations the Wood Anemone, Blue Apennine Anemone (escape), Sweet Violet, Dog Violet (*V. Riviniana*), Primrose, Ground Ivy, Spurge Laurel, Lesser Periwinkle, and, in suitable habitats, the Lesser Celandine, Marsh Marigold, Cuckoo Flower, Garlic Mustard, Furze, Blackthorn, Barren Strawberry, Coltsfoot, Butterbur, Red Deadnettle, White Deadnettle, Wych Elm, Goat Willow, Yew and Wild Hyacinth, were observed in flower. The Winter Aconite was in fruit.

FUNGI.—Mr. F. A. Mason reports that three comparatively small areas were investigated for fungi and mycetozoa, viz.:—the Castle Grounds, Mount Airey and Weedley Springs. Although Mr. Greevz Fysher and he were the only members of the Mycological Committee present at this meeting there was no lack of assistance in collecting what fungi were available, and specimens were handed in by the President, Mr. Stainforth, and others. The district is only sparsely wooded, and except for a few trees in the Castle grounds very little old timber was seen. Ash, birch and larch trees were all notably free from fungus parasites, and it was too early for cultivated and other plant diseases to have asserted themselves. *Polyporus squamosus* and *Fomes annosus* were the only polypores growing on trees. *Daedalea quercina* occurred on a gate-post and a small specimen of *D. confragosa* on a fallen branch, both at Weedley Springs. 'Jews Ears' were found on some large ash logs in the Castle grounds, and also on their usual host, the elder, at

Weedley Springs. The only typically spring species was *Disciotes* (*Peziza*) *venosa*; fine specimens were collected at Weedley Springs by Miss Hilary, and some curiously contorted examples of this discomycete were found in the Castle grounds.

Numbers of Pyrenomycetes and allied fungi were collected from plantation débris on Mount Airey. Most of them were forwarded to Sir Henry C. Hawley, who informs me that they included some interesting species, seven of which he has kindly identified; one of them, *Anthostoma decipiens* (D.C.) Nke, is new to Yorkshire, and two others, *Eutypa flavovirens* Tul. and *Diatrype stigma* Fr. have not been previously recorded for South-east Division.†

A list of species collected during a previous meeting of the Yorkshire Naturalists' Union at South Cave, was reported by Charles Crossland (*The Naturalist*, 1907, p. 289); the following are additional species:—

FUNGI.			
<i>Galera tenera</i> (Schaeff.) Fr.	C.	* <i>Diatrype stigma</i> Fr.	A.
<i>Tubaria furfuracea</i> (Pers.) W.G.		<i>Leptospora spermoides</i> (Hoffm.)	A.
Sm.	C.W.	Fuck.	
<i>Hypholoma fasciculare</i> (Huds.)		** <i>Anthostoma decipiens</i> (D.C.)	A.
Fr.	C.	Nke.	
<i>Psilocybe foenisecii</i> (Pers.) Fr.	A.C.	* <i>Rhopoglyphus Pteridis</i> (Sow.)	A.
<i>Panaeolus sphinctrinus</i> Fr.	C.	Wint.	
<i>Polyporus squamosus</i> (Huds.)		* <i>Disciotes venosa</i> (Pers.) Boud.	C.W.
Fr.	C.		
<i>Polystictus velutinus</i> Fr.	W.	* <i>Helotium virgultorum</i> (Whal.)	W.
<i>Daedalea quercina</i> (Linn.) Fr.	W.	Karst.	
<i>D. confragosa</i> Pers.	W.	<i>Dasyscypha nivea</i> (Hedw. fil.)	W.
<i>Irpex obliquus</i> (Schrad.) Fr.	W.	Sacc.	
<i>Stereum purpureum</i> (Pers.) Fr.	C.A.	<i>Mollisia melaleuca</i> (Fr.) Sacc.	W.
<i>Coniophora puteana</i> (Schum.)		* <i>Trochila Laurocerasi</i> (Desm.)	C.
Fr.	C.W.	Fr.	
<i>Dacryomyces deliquescens</i> (Bull.)		<i>Phacidium multivalve</i> (D.C.)	C.
Depy.	W.	Kunze. et Schum.	
<i>Lycoperdon gemmatum</i> Fr.	W.	<i>Stegia Ilicis</i> Fr.	C.
<i>Uromyces Poae</i> Raben.	C.W.A.	<i>Rhytisma acerinum</i> (Pers.) Fr.	W.
<i>U. Ficariae</i> Lév.	C.W.A.	<i>Phoma herbarum</i> West.	A.
<i>Puccinia tumida</i> Grev.	C.W.	<i>Macrosporium commune</i> Raben.	W.
<i>Nectria cinnabarina</i> (Tode) Fr.	C.W.		
<i>Leptosphaeria acuta</i> (Moug. &			
Nest.) Karst.	A.		
* <i>Eutypa flavovirens</i> Tul.	A.		
<i>Diatrypella quercina</i> (Pers.) Nke.			
	A.W.		
MYCETOZOA.			
		<i>Reticularia lycoperdon</i> Bull.	W.
		<i>Lycogala epidendrum</i> Fr.	W.
		<i>Comatricha nigra</i> Schröt.	W.
		<i>Trichia Botrytis</i> Pers.	W.
		<i>Perichaena corticalis</i> Rost.	W.

C. = Cave Castle Grounds; W. = Weedley Springs; A. = Mount Airey.

* Not previously recorded for South-east Division. ** New to Yorkshire.

MOLLUSCA.—Mr. Greevz Fysher reports that for the district the following species were obtained alive and vouched by Mr. John W. Taylor:—*Helix aspersa*, *H. nemoralis* vars. *petiveria* ooooo and *libellula* 12345, *Theba cantiana* vars. *leucozona* and *minor*, *Helicigona arbustorum*, *Hygromia hispida* vars. *cornea* and *fusca*, *Xerophila virgata*, *Xerophila caperata*, *Hyalinia cellaria*, *H. alliaria*, *H. nitidula*, *H. pura*, *Vitrina pellucida*, *Clausilia laminata*, *C. bidentata* var. *everetti*, *Arion ater* var. *brunnea*.

† Since this note was written, I have been informed that another species, sent to the British Museum, has been identified by J. Ramsbottom as *Calosphaeria minima* Tul., a first record of this fungus for Great Britain.—F.A.M.

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- (To be continued).

—: o :—

We find from *The Leeds Mercury*, May 19th, 1921, that Mr. Arthur Draper, of Appleby Carr, near Harrogate, has got thirteen live ducks from ten duck-eggs put under a broody hen. A correspondent adds:—'You can't beat this in Hull!!' I think the tale might have been improved in one respect, he ought to have said he got 13 ducks from 10 hen's eggs, put under a Cuckoo.

We learn from *The Yorkshire Weekly Post* 'It is recorded that a notorious malefactor at Tyburn claimed his right to make a last dying speech and confession from the scaffold, and said, if the audience would permit him, he would like to make a few remarks on the Corn Laws. Certain writers of Nature Notes take an equally wide view of their privileges. We came across a column the other day, describing the birthday presents received by the author, explaining how he came to be so good and great a man, and offering a few general remarks as to the state of his wife's health. This was headed "Nature Around Huddersfield."'

In Memoriam.

L. S. BRADY, 1867-1921.

Born at Sunderland, commencing at an early age about 46 years ago, L. S. Brady and I collected lepidoptera diligently, as children do, and after a lapse of a few years, owing to school life, we both took the hobby up seriously about 1889, and for many years spent holidays and spare time collecting and observing in England, Wales and Scotland. His keen sight was invaluable on these occasions—ova of *Agrotis Ashworthii*, on the Welsh rocks, fell to our lot with other species, whilst at all times he was an enthusiastic, well read, and most interesting companion to anyone who knew him well enough to penetrate the reserve and reach the man himself. He was a specially successful hand at breeding insects *ab ovo*, always kept full and careful notes of his captures and observations, and during recent years had been working steadily on the genitalia of more obscure groups which promised to give good results, but now, I fear, of no avail.

For several years his health had not been good and a severe illness in 1920 left his constitution much shaken.

Early in April a sudden attack of double pneumonia developed, and in a few days, on April 11th, aged 53, he passed away, leaving a widow and child to mourn his loss, which is shared by very many who have met him at odd times and collected with him, among whom the writer includes himself as his oldest, closest and most deeply attached friend.—JAS. W. CORDER, Sunderland.

To the foregoing we should like to add that Brady, although born at Sunderland, removed to Sheffield many years ago, and resided there until his death. He did much valuable work among the lepidoptera of our county, adding *Tortrix semialbana* and *Penthina nigricostana* to the Yorkshire List. About twenty years ago he brought forward an exceedingly fine melanic form of *Venusia cambricaria* (var. *bradyi*) from the woods in the Sheffield district, and since then he and the present writer have found it to occur there in abundance, and to be the prevailing form, though even yet, so far as we know, it has not been observed in any other district in Britain. Brady also found *Eupithecia isogrammata* in profusion on *Clematis* at Wadworth, Doncaster, and he added other local species to various Yorkshire localities. As Mr. Corder says, he was reserved in his character, but those of us who knew him well, and had frequently made enjoyable collecting expeditions with him, and had spent winter evenings with him in study over the cabinet specimens, know what a kindly disposition he had, and how unreservedly he imparted his knowledge (and his duplicate specimens) to his friends.—G. T. P.

CORRESPONDENCE.

FEEDING HABIT OF THE GREAT SPOTTED WOODPECKER.

The feeding habit of this bird as recorded by Mr. Stracey in *The Naturalist*, page 106, is a curious deviation from its usual habits in this country. Is it not possible that the Woodpecker might have been feeding upon larvæ of some insect or insects inside the fir cones?—E. P. BUTTERFIELD.

—: o :—

Rook's Nest on a Telegraph Pole.—In one of the main streets of Barnsley there is a small rookery which has been in existence about forty years. This year a pair of birds from this community has constructed a nest on the top of an adjacent telegraph pole. This nest was destroyed by the postal authorities, but the birds have since built a second nest.—R. FORTUNE.

***Dytiscus dimidiatus* in East Yorkshire.**—On looking through my collection recently I found among some *Dytiscus marginalis* two males of the above species, which had been taken in a pond in Bubwith Ings on August 10th, 1911. This species I have taken in its Askham Bog locality in April of the same year. We thus possess in the East Riding all the British *Dytisci* with the exception of the Scotch *D. lapponicus*.—W. J. FORDHAM.

Osprey in North-east Yorkshire.—While fishing on Lockwood Reservoir, about five miles from Guisbro', on April 26th, an Osprey flew about the lake for over half-an-hour. It came close to me three or four times, perhaps within twenty yards. After circling about it went up about 100 yards and dropped like a stone, striking at a fish in the middle of the reservoir and making a tremendous noise and splash when it struck the surface. I could not see if it got the fish or not. It then flew slowly away, inland, and did not return. M. A. HORSFALL, Ingleby Greenhow.

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Les Coléoptères d'Europe : France et Régions voisines. Tome I. par Constant Houlbert. 332 × xii pages, 104 fig. dans le texte et 16 planches. 18 grand Jésus. Prix, (Broché) 10 fr. (Cartonné toile) 12 fr. Librairie, Octave Doin, Paris. Les travaux de systématique ne sont pas rares en France, cependant, c'est la première fois qu'un traité élémentaire de l'entomologie est consacré à l'anatomie des Coléoptères et à leur classification. Dans le tome premier de cet ouvrage (les tomes II. et III. sont sous presse) sont donnés des chapitres sur la Morphologie Générale, l'Embryogenie, la Biologie Générale des Larves, et la Classification des Coléoptères Adultes. La livre troisième du tome contient une relation des genres des Coléoptères d'Europe (Géocarabiques et Hydrocarabiques). Afin d'éviter la sécheresse naturelle inhérente à un ouvrage qui ne serait composé que des seuls tableaux d'analyse, l'auteur a donné, en tête de chaque famille, quelques indications générales sur les insectes qui la composent. Nous voudrions bien recommander cet ouvrage non seulement aux étudiants, mais encore aux amateurs dans les diverses sociétés scientifiques du comté de Yorkshire.

NORTHERN NEWS.

We understand that Sir Hercules Read, Keeper of the Department of the British, etc., Antiquities at the British Museum, retires in July, having completed 40 years' service.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. Chas. P. Rimmer exhibited a long series of *Cerastis vaccinii* to shew the variation of the species at Delamere Forest. Mr. W. Mansbridge shewed *Selenia tetralunaria* which had emerged in a warm room during February. A further meeting was held at the Liverpool School of Tropical Medicine, when the visitors were received by Professor Robert Newstead, F.R.S., and the staff of the Entomological Department. Professor Newstead gave a brief sketch of the work of the Entomological Department since the last visit of the Society. Investigations bearing on questions of public health had been carried out on behalf of the Ministry of Health and the Port Sanitary and the Public Health Departments of the City of Liverpool. There were exhibited some living examples of the larvæ of the rot-hole breeding mosquitoes, *Anopheles plumbeus* and *Ochlerotatus geniculatus*, from the district round Liverpool; also adults of *Culex pipiens* and *Anopheles bifurcatus*.

The annual general meeting of the Darlington and Teesdale Naturalists' Field Club was held in the Museum and Meeting Room, Mechanics' Institute, Darlington, on April 26th. The President, Mr. E. O. D. Gibson, in the chair. The Treasurer's report showed a balance in hand of £10 12s. 6d. The Hon. Treasurer, Mr. R. H. Sargent, explained that the fall in balance was due to some heavy payments having to be made, and that the profits from the joint-popular lectures had not yet been received. The Hon. Secretary, Mr. J. E. Nowers, in his report, stated that there was an improvement in the attendance at the meetings. The excursions had all been carried out, and the museum had received many specimens, including a type collection of British birds' eggs. A series of popular lectures had been held jointly with the Mechanics' Institute. The following officers were elected for the ensuing year:—President, Mr. C. P. Nicholson; Vice-Presidents, E. O. D. Gibson and Walter Hodgson; Hon. Treasurer, R. H. Sargent; Hon. Secretary, John E. Nowers (6 East Mount Crescent); Librarian, Jas. Broadhead; Curator, E. O. D. Gibson. The Section Leaders:—Archæology, J. B. Ord; Botany, R. H. Sargent; Zoology, W. Hodgson; Geology, S. W. Hughes, M.Sc.; Photography, L. W. Williamson.

The annual meeting of the Leeds Philosophical and Literary Society was held recently under the chairmanship of the President, Mr. Sidney D. Kitson. The report presented by Lt.-Col. E. Kitson Clark (Hon. Secretary) stated that the membership was 204, as compared with 218 last year. The Christmas museum lectures given by the Curator had been attended by 1183 persons, as against 929 the previous year, and the number of visitors to the museum during the year was 30,914, a decrease of 170 on that of last year. These numbers did not include visits made by school children under the Schools' Museum Scheme, and over 15,000 pupils and 500 teachers had attended the lectures. The situation which has arisen out of the negotiations for the transfer of the Society's property is still receiving the close attention of the Council. In moving the adoption of the report, Mr. J. E. Bedford said he hoped to see their collection housed in a modern museum, and he believed the Society would do even still greater work in better premises. Mr. R. A. Wilson (Hon. Treasurer) reported that at the beginning of the year there was a balance due to the treasurer of £1245, and at the end of the year £906, but this was due to the realisation of an investment, which brought in £779. Actually, there was a loss on the year of £440. Lt.-Col. Kitson Clark expressed the view that their building would serve the purposes of the present museum, given light. In the upper rooms there was plenty of space in which to display the collection. The report and balance sheet were adopted, and the officers re-elected.

NEWS FROM THE MAGAZINES.

In *Nature*, No. 2684, Hilderic Friend asks 'Why do worms die?'

'A Mansfield Mixture' is the somewhat absurd title to a note in *The Entomologist's Record* for March.

Prof. R. Newstead describes 'The Roman Cemetery in the Infirmary Fields, Chester,' in the *Liverpool Annals of Archaeology and Anthropology*.

Among the contents of *Science Progress* for April, we notice 'Sex Heredity,' by A. S. Parkes, and 'The Physical Investigation of the Soil,' by B. A. Keen.

'One Man's Work for us all: The Man who named the plants and animals' is the title of an illustrated 'Life Story of Carl Linnæus' in Arthur Mee's *My Magazine* for May.

Dr. G. R. Goldbrough has a paper 'On a Characteristic Property of the Tidal Streams of the Straits of Dover,' in the *Proceedings of the University of Durham Philosophical Society*, recently issued.

W. J. Lucas contributes 'Notes on British Orthoptera, 1920,' and T. D. A. Cockerell and F. H. Haines write on 'Fossil Tipulidæ from the Oligocene of the Isle of Wight,' in *The Entomologist* for April.

In the March issue the editor of *The Scottish Naturalist* suggests the formation of a Scottish Naturalists' Union, one object of which will be to ensure the publication of the field observations made by Scottish naturalists.

The Lancashire and Cheshire Naturalist for March is full of good local material, including records of various 'neglected' orders by R. S. Bagnall; but surely 'Scottish Plant Names' would have been more appropriately placed elsewhere?

The Lancashire and Cheshire Naturalist (Vol. XIII., No. 8) contains notes on the mammals and birds of the counties covered by the title of the journal, by T. A. Coward and W. H. Heathcote; as well as 'Clay Bank Vegetation,' by W. G. Travis.

In some notes on 'The Boulders of the Travellers' Rest Gravel Pit, Cambridge,' J. E. A. Wheeler, in *The Geological Magazine* for May, records erratics from Scandinavia, Scotland and Scottish Borders, Lake District, and North-eastern and Eastern England.

The New Phytologist for March, contains 'The Biochemistry of Carbohydrate Production in the Higher Plants,' by F. F. Blackman; 'Heterothallism,' by E. M. Cutting; 'Suberin and Cutin,' by J. H. Priestley, and 'Studies in Phænology,' by F. Darwin.

A useful account of the current theories in connexion with the 'Isle of Wight Disease' of Bees is given in *The Journal of the Ministry of Agriculture* for April. It is suggested that the name 'Isle of Wight' Disease is unsatisfactory, and that a better term would be 'Acarine' disease.

J. H. Keys describes *Cathormiocerus attaphilus* Bris.: an addition to the British Coleoptera, and J. Edwards writes 'On a Second British Species of *Priobium*: *P. kiesewetteri*, nom. nov. = *tricolor* Kiesw. (nec Ol. nec Muls.), and F. Laing describes various genera of British Aphides (Homoptera), in *The Entomologist's Monthly Magazine* for May.

We are glad to notice from *The Museums Journal* that it will appear monthly and not less frequently as was recently proposed. The reason is naively given as 'the Hon. Treasurer in his financial statement has unexpectedly revealed a better position than anticipated.' Surely the executive committee could have considered this point before taking the drastic step which they did.

Notwithstanding the fact that Mr. C. Granville Clutterbuck took a musketry course during Easter, 1918, obtained a First Class Instructor's Certificate and took a class which met two night's a week until the middle of June, and also had an allotment, he has been able to contribute two-and-a-half pages on 'Collecting in 1918 and 1919 in Gloucestershire, etc.,' to *The Entomologist* for May.

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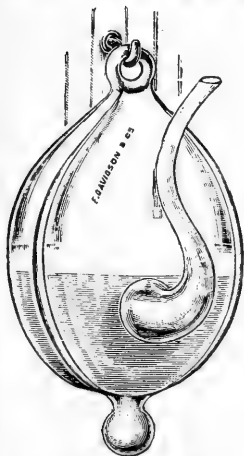
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RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

NORTHERN NATURAL HISTORY NOTES.

The Yorkshire Weekly Post (7-5-21) records the case of a pair of rooks building a nest upon the chimney stack at Filey, adjacent to a former rookery in the town, where the trees had been felled to make room for a new building. The *Bradford Daily Telegraph* (31-5-21) records an extraordinary site chosen by a pair of blue tits for their nest. There is a roundabout a hobby-horses in Shipley Glen. One of the horses had lost its tail, and the hole where the tail ought to have been led right into the interior of the horse. It was here the nest was built, and during Whitsuntide, when hundreds of children used the horses, the female bird sat tight on her eggs while she was whizzed around. The eggs have since hatched, and the parents are busy feeding the young. Last year a pair of tits used the same site.

RATS.

Much has been heard in recent years about the damage done by rats, the following from *The Shooting Times* (21-5-21) will take some beating :—During the clearing of some badly infested premises in Barnsley, where a defective sewer had given rats an easy entrance into some shops and warehouses, it was found that in one place the creatures had carried a heap of monkey nuts sufficient to fill twenty-three baskets, not to mention quantities of raisins and other foodstuffs, from a grocers' shop into a drapery store. In a three-storeyed grain store, the rats had packed the spaces between the floor boards with corn of all kinds, sufficient, at a rough estimate, to fill two hundred to three hundred sacks.

WHITE-TAILED EAGLE.

An echo of the destruction of the White-tailed Eagle in the Peak District is that Ernest Dearden, gamekeeper to Lord Edmund Talbot, was fined £1 and 2 guineas costs, and the bird confiscated, for, as one paper quaintly puts it, shooting a sea-eagle, *the pet of the Duke of Devonshire's keeper in the adjoining estate.*—R.F.

' FISHERIES IN THE GREAT WAR,

Being the report on Sea Fisheries for the years 1915, 1916, 1917 and 1918 of the Board of Agriculture and Fisheries, Parts 1 and 2, xxxix.+195 pages, 2/- net.' From the formidable character of the above title one might assume that this particular volume is one of the usual technical reports issued by the Government. Certainly it deals with various aspects of the Fisheries question so far as it relates to the Seas around the British Islands, but the volume contains a most fascinating report of the doings of the Fishermen during the war, which is as entertaining as any novel we have

read. The manner in which the fishermen assisted in the war is here set out, in a way which we have not previously seen described.

DRAWING OF FISHES 2000 YEARS OLD.

A valuable addition has been made to the collection at the Museum of Fisheries and Shipping at Pickering Park, Hull. It consists of a shallow dish-shaped stand in terra-cotta from Corinth, 11 inches wide, with representations of three Mediterranean fishes painted about 2000 years ago. These are a Torpedo, a Sea Perch, and probably a Bass. There is also an egg-shaped drawing on the plate which may represent a



jellyfish. There is a hole in the centre of the dish to drain the boiled fish. The down-turned edges of the plate are decorated in black curves to represent waves. A very similar fish-plate, with representations of different species of fish, is figured in the British Museum 'Guide to the exhibition illustrating Greek and Roman Life,' 1908, p. 115.

BOOKS ON MAPS.

One result of the war has been that more particular attention has been paid to the question of Maps and Mapping, and the necessity for a thorough knowledge of cartography has been indicated. We have already noticed a number of volumes on this subject during the past year or two, and before us are four volumes which have just been published. The Cambridge University Press has issued 'Maps, their History, Characteristics and Uses,' by Sir Herbert George

Fordham (84 pages, 7/6 net). Sir George was one of the first in recent years to draw particular attention to the valuable information to be derived from a study of old topographical maps, and in the present little volume he brings together, in permanent form, a series of five lectures delivered in Cambridge, to the teachers of Cambridgeshire. He refers to the history of map-production from the earliest times, and by the aid of illustrations from typical maps of various periods, gives a very fascinating narrative.

GEOLOGICAL MAPS.

The same house has issued 'The Study of Geological Maps,' by Dr. Gertrude L. Elles (74 pages, 12/- net). In her case, likewise, the book is based upon notes for a course of lectures, in this instance given to successive generations of Girton and Newnham students, and there is no doubt that the author has been well advised in bringing her notes together in this useful way. Dr. Elles has a charming style, and, in addition, a thorough knowledge of the various complicated measurements necessary in mapping, so that her book applies equally to beginners and to advanced students. The volume is illustrated by an enormous number of diagrams, sections and maps, each of which has been carefully selected to illustrate some particular point.

MAP READING.*

The author is a member of the Army Educational Corps, and this book is entirely devoted to the question of reading military maps. The scope of the work can be judged from the following headings of chapters: The Compass, The Scale, The Contours, Gradients, Visibility, Conventional Signs, Map References, etc. There are appendices, and an enormous number of sketches and diagrams illustrating various aspects of Map reading, at the end of the volume.

SKETCH-MAP GEOGRAPHY.†

Under the above title, E. G. R. Taylor has written 'a text-book of World and Regional Geography for the middle and upper schools,' on new lines. Instead of the text being illustrated by maps, the book consists of 160 maps, supplemented by a series of brief explanatory notes. The sketch-maps 'show different categories of facts in combination when they are seen to be, not merely facts, but factors, determining some particular result.'

* By G. H. C. Dale, 170 pages and 20 plates, MacMillan & Co., price 7/6 net.

† 147 pp., 5/- net, Methuen & Co. We believe these are the publishers, but the name is so messed up with a rubber stamp that we can't be quite certain.

THE NEWCASTLE MAP.

As an example of the author's methods, he states: 'Suppose, for example, that the factors contributing to the growth and importance of Newcastle are required, the sketch-map shows the city at the head of an eight-mile estuary, in the midst of a sea-board coal-field, at the mouth of a gap through the Pennines, at a point between the Pennine Spurs and the tidal waters where the main route to the North must necessarily cross the Tyne. Arrows indicate the export of coal, and the import of iron from Tees-mouth not thirty miles away, while a line of latitude with a brief note relates the port to the opposite shore of Europe.'

W. M. WEBB AND THE BRITISH ASSOCIATION.

In his report as delegate from the Selborne Society to the Cardiff Conference of Delegates held in connexion with the meeting of the British Association (*Selborne Magazine*, No. 346), W. M. Webb states: 'As a delegate who has been present at the conferences for many years, the writer cannot help feeling that the results are by no means commensurate with the trouble that all concerned take in the matter. The seed is certainly scattered, but there is no attempt made to prepare the ground or to secure any crop. The Association could fulfil much of its objects through the local societies, but nothing will be done satisfactorily until it is in personal touch with them all.'

DEER ANTLERS.*

By the aid of a remarkable series of micro-photographs and illustrations of normal and abnormal antlers, the author helps to elucidate the manner of the extraordinary annual growths and sheddings of the bone-like structures on the heads of the deer family. His work is on new lines, and demands the attention of the student, field naturalist and sportsman alike. An abnormal antler, more extraordinary than any shown by Mr. Macewen, was figured in *The Naturalist* for 1917, p. 231.

DERBYSHIRE CHERTS.

In the *Geological Magazine* for June, H. C. Sargent has a paper on 'Carboniferous Cherts in Derbyshire,' in which he concludes that 'the cherts of Derbyshire are mainly of direct inorganic origin and contemporaneous with the associated limestone and clays. It is, however, possible that siliceous organisms have furnished a subsidiary source of supply, since dredgings show that organic silica is not absolutely

* 'The Growth and Shedding of the Antler of the Deer: the histological phenomena and their relation to the growth of bone,' by William Macewen, Glasgow. Maclehose, Jackson & Co., 109 pp., 10/6 net.

insoluble in sea-water. It is thought, further, that the evidence shows that the chert is not a metasomatic replacement of the limestone, except to a very limited extent. The existence of large beds composed of siliceous organisms which have not been dissolved is a point that cannot be ignored by advocates of the organic theory. Although the Derbyshire cherts alone have been discussed, it is believed that the same conclusions will be found to apply to other areas.'

NATURE NOTES.

Under the above heading 'the Chapel Cuckoo' writes to *The Savile Screamer*, a new nature(?) journal, issued by Messrs. A. Brown & Son, as under:— 'About this time of the year a ramble on Springhead Road or Love Lane is a great joy to the student of Nature. He (or she) can discover where the Larkspur lurks and the Larks purr. In an adjoining field Chaffinches chaff and the Chiff Chaff fin(i)shes the chaffers, while with care in searching among the tall grass may be found a little green Linnet with a little green in it, and in the adjoining fields the Moles make small molds, which some turn into mountains. Care should be taken by the uninitiated not to confuse a Mole-hill with an Ant-hill, as to repose on the latter is rather dangerous; so much so, that Ant-hills are called "Resurrections"; to sit on them is to "rise again." An Ant has antennæ, whereas in a Mole there antennæ.'

HOW 'DINOSAURS' ARE MADE.

The Transactions of the London and Middlesex Archaeological Society recently issued are principally devoted to papers dealing with antiquarian subjects relating to London and the immediate vicinity. From some short notes we gather that the 'Enfield Dinosaur,' which was referred to in the London newspapers some little time ago as 'obviously . . . some huge reptile of the dim past,' proved to be the remains of a small horse, fragments of a small ox, and of the antler of a deer, which did not show any peculiarities distinguishing them from existing species. It appears that the newspaper representative compared the bones with a picture in Wells' 'History of the World,' and hence gave the remarkable piece of information to the public; of such is 'history' made.

LEAD ORES.

Presumably from a bibliographical point of view the title of the pamphlet before us is 'Imperial Institute, Monographs on Mineral Resources, with special reference to the British Empire—Prepared under the direction of the Mineral Resources Committee, with the assistance of the Scientific and Technical Staff of the Imperial Institute.' Actually, however, it should be 'Lead Ores,' by T. C. F. Hall. As works of this

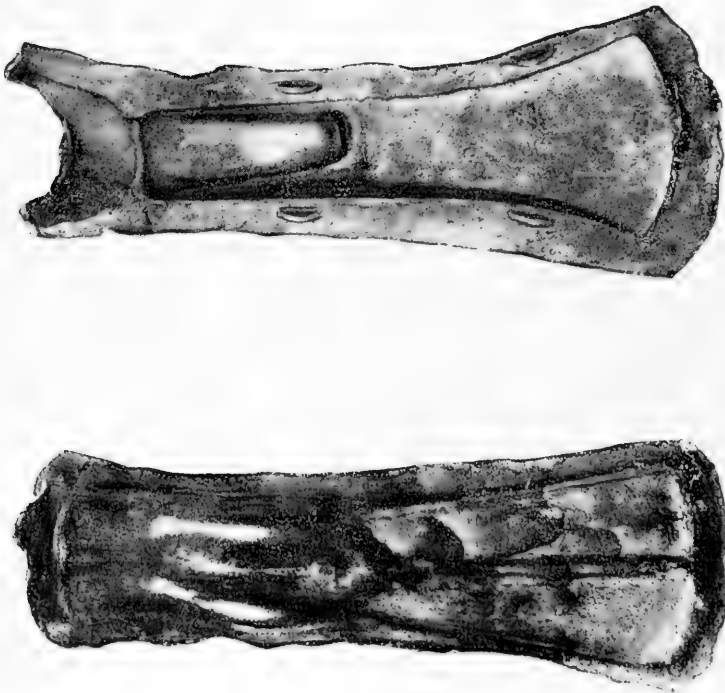
sort are usually considered to be of sufficient importance to be included in Bibliographies, we consider it would be much better if authors, editors and publishers would use a little care in preparing the title pages of this class of work, as, for instance, in this case people in search of information relating to Lead Ores would have to look in the index under 'Imperial Institute.' The volume (127 pages, John Murray, London, 6/- net) contains a summary of the occurrence and sources of supply of Lead, not only in the British Empire, but in various foreign countries in the world. There is a brief appendix dealing with the question of Lead poisoning, a poor map showing the Lead-bearing districts of the world, and what is described as a 'list of references to literature on Lead,' but this only deals with such as are referred to in the text. The publication is issued under the direction of an advisory Committee on Mineral Resources.

THE LEEDS MUSEUM.

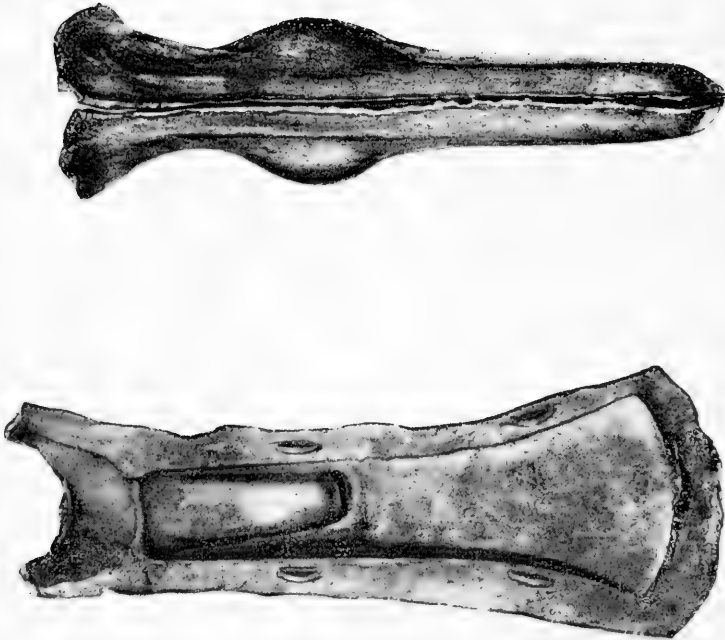
The proposal to transfer the hall and museum of the Leeds Philosophical and Literary Society to the Leeds Corporation came before an extraordinary general meeting of the proprietary and ordinary members and annual subscribers of the Society recently, but it was not found to be possible to determine the policy. It is necessary for three-fifths of the members to pass a resolution to dissolve the Society, as a necessary preliminary to its immediate reconstruction, but the voting at the meeting did not include a number sufficient to represent three-fifths of the membership. The heads of arrangement have received the unanimous approval of the Council of the Society, and, with very few exceptions, the approval of the members who attended the meeting. The Society will convey the Philosophical Hall, Park Row, and transfer all its collections, property, investments, and other assets, except the Society's books, to the Corporation upon the following terms:—

THE CORPORATION TERMS.

The Corporation will undertake to set aside £1,500 a year for 25 years, £1,000 of which will be for the use of the new Society, and £500 for a special fund under the control of a sub-committee for maintaining the collections and adding to them. The Corporation will either keep the collections in the present museum or remove them to other buildings suitable for the purpose. While the collections remain in their present buildings, the Corporation will allow the Society the free use of the present lecture hall and council room and secretary's room, and pay all rates and charges. If the Corporation remove the collections to another building, they will provide therein for the use of the Society a lecture hall to accommodate at least 400 persons, and a council room to accommodate



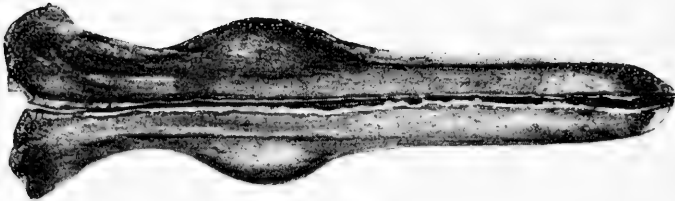
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Views of Bronze Mould and Axe found at Hotham.

at least 50 persons, and a secretary's room upon similar conditions. The Corporation will be able to use the lecture hall and council room, and let and take rent, provided they are not required for the purposes of the Society. The management of the museum and its collections will be under the control of a special sub-committee of the Libraries and Arts Committee to be set up by the Corporation, and to consist of 14 members, seven to be nominated by the City Council, and seven to be nominated by the Society. The Corporation will undertake that the museum and its collections shall be always placed *under the charge of a competent scientific curator, who shall hold no other office under the Corporation*, and such collections shall be open to public inspection at reasonable times. They will take over Mr. H. Crowther (Curator) and the existing staff of the old Society, and will take over all financial liabilities of the Society existing at the date of the transfer. The sub-committee will be at liberty to transfer certain duplicates and other articles to the Leeds University, or other authority, one month's notice of such proposal to be given in each case to the members of the sub-committee.*

A BRONZE-AGE MOULD.

The Hull Museums have just acquired a cast of a Bronze Mould found at Hotham Carrs, East Yorks., in 1867. The mould was used for casting bronze axes of the palstave type, and was found with a hoard of axes, nearly all of which were damaged and broken, and seemed to have been gathered together for the purpose of being re-cast. Examples of stone moulds have, at times, been found, but it rarely happens that bronze moulds are discovered in this country. The mould is $7\frac{1}{4}$ inches long, nearly 2 inches broad in the centre (when the valves are placed together), and $2\frac{3}{4}$ inches wide in its widest part. The two parts fit together with much precision, which is strong evidence of the high degree of efficiency in bronze casting attained by the Britons. On the outside the mould is slightly ornamented by ridges, but as near as possible the mould is the shape of the axe, being not unnecessarily thick in any part. One valve has five projections (two on each side and one on the bottom), the other half having corresponding holes into which the projections fit. In every detail the mould is well and carefully made. Colonel J. B. Stracey-Clitherow presented to the Museum some little time ago a bronze palstave found at Hotham in 1884, which is probably part of the hoard found with the above mould.

* We hear the Corporation has since agreed to these terms.

PERTHSHIRE NATURALISTS.

The Perthshire Naturalists' Society continues to publish its valuable *Transactions*, and Part 2, of Volume VII., is before us. There are several valuable papers, principally referring to the Society's area of operations. G. F. Bates describes 'Anomalies of Plant Structure'; W. Barclay writes on 'A Forgotten Perthshire Botanist—Robert Macnab'; J. R. Matthews on '*Zannichella palustris* Linn. in Perthshire'; and H. Coates gives the 'History of the Strathmore Meteoric Fall of 3rd December, 1917'; the last a detailed and exceptionally valuable contribution.

A 'BOULDER' STORY.

On one of the late Prof. G. Frederick Wright's early visits to this country, he gave an address at the York Museum, during which he gave a lantern illustration of what he described as the largest Boulder in the World. It was in America. At the close of the lecture someone in the audience pointed out that in England, in Norfolk, there was a much larger boulder of chalk, upon which an entire village was built, and the village obtained its water supply by boring in that boulder of chalk! Also that the speaker had obtained this information from Professor Wright's own book on 'Man and the Glacial Period'!

GROSSULARIATA.

In *The Entomologist's Monthly Magazine* for June, Mr. G. T. Porritt has a valuable paper on the 'Huddersfield varieties of *Abraxas grossulariata*, with description of a new variety.' He points out that perhaps in no locality in the United Kingdom is the species known to vary so much as in the Huddersfield area. Of the named forms there are no fewer than thirty-three, without the alleged varieties of *varleyata* named by the Rev. G. H. Raynor, already referred to in these columns.

A NEW VARIETY.

Mr. Porritt describes a new variety under the name of *melanapicata*. He says, 'In this variety the wings are more or less normal, except that the apex of the fore wings is entirely filled in with a large, more or less square blotch of black. The form occurs occasionally from wild larvæ, and my few cabinet specimens of it include one covered with the *nigrosparsata* spotting.'

A BEAVER DAM.

Mr. George Sheppard, B.Sc., F.G.S., writes from Edmonton, Alberta, as follows:—'I enclose two photographs of a Beaver

Dam, which I took recently in Southern Alberta. As you know, the activities of these animals are such that in the



course of time they actually alter the drainage system of the area in which they work. As the Beaver was an inhabitant



of East Yorkshire many years ago, and probably carried on the same kind of engineering work there, these pictures should interest your readers.'

FOOD OF BOREUS.

CYRIL L. WITHYCOMBE, F.E.S.

I WAS much interested in seeing Mr. C. A. Cheetham's notes on *Boreus* in *The Naturalist* for May. I have found *Boreus hyemalis* not uncommonly in Epping Forest in November, but never later than December, so that with us it appears to be comparatively short lived, and I doubt if it requires much food. I tried several experiments to ascertain what kind of food was taken. Owing to their abundance, spring-tails were first given, but with negative results. Other insects were offered, some after being damaged, but all without result as long as the insect continued to shew any movement. Finally a crushed fly was tried, and *Boreus* was seen to feed on the juices which had been squeezed out. On a diet of this kind I was able to keep one specimen alive for 37 days, this being some time after those in the wild state had disappeared. Several *Boreus* confined with numbers of *Podura*, etc., died in a week or so, apparently unable to feed on the fare provided. Of course, soft-bodied larvæ or worms may be the natural food. I did not try these.

It is interesting to know that Mr. Cheetham found *Boreus* on the snow, and that insectivorous birds were absent. In the forest I went on two occasions to look for *Boreus* after snow, in places where it was known to occur, but with no success. Insectivorous birds were very plentiful, however.

With regard to the suggestion that the larval *Boreus* 'requires summer conditions,' I have found larvæ full fed as early as December, but more usually they reach this state in February or March, pupation not taking place before the end of August or September.—WALTHAMSTOW, May, 1921.

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Flying Homer Pigeons, by A. J. Macself. *Country Life*, London, 9d. net. This forms one of a series of Practical Handbooks issued by *Country Life*. In its 32 pages it gives a good deal of useful advice for the novice and the veteran pigeon flyer. In a concise and practical manner an ideal loft and fittings are described, how to form a stud is fully explained, with details as to mating and breeding, proper feeding and the training of young birds; a useful chapter is devoted to ailments and diseases, with remedies to correct them. One is glad to see that the author condemns the use of 'Salt Cat,' a curious name given to a mixture of rock salt, old mortar and sand, which the old fancier believed to be absolutely necessary for the health of the birds. The author is convinced that an excess of salt and lime instead of being beneficial to health is wholly detrimental. The frontispiece is a photograph of a remarkable bird, a red chequer cock 'The Talisman,' which flew 515 miles 1519 yards in 10 hours 50 minutes; a velocity of 1396 yards per minute.—R.F.

GAULT FORAMINIFERA FROM FORD, BUCKS.

E. HOLLIS, F.Z.S., AND E. NEAVERSON, B.SC., F.G.S.

IN past times the Gault was worked at Ford, four miles south-west of Aylesbury, for phosphatic nodules ('coprolites'), which occur at the top of the Lower Gault. The workings were abandoned many years ago, and nothing now remains but the spoil-heap, which is completely grassed over. Judging by specimens of ammonites in the Bucks. County Museum, Aylesbury, the deposit worked belonged to the zones of *Hoplites auritus* and *H. lautus*. At the typical locality of Folkestone, these zones occupy 17 feet out of a total of 99 feet for the whole of the Gault; but at Ford only three or four feet seem to have been worked. Critical zonal study is, of course, impossible; but residues obtained by washing the clay yielded a large series of Foraminifera. Specimens of these have been deposited in the geological collection of the Bucks. County Museum.

The Gault Foraminifera of the classic exposure at Folkestone have been fully investigated by F. Chapman (*Journ. Roy. Micr. Soc.*, 1891-8). In all 265 species are described and figured from the Gault, of which some 145 occur in the lower zones. At Ford, 135 species have been identified, some of which occur only in the Upper Gault of Folkestone. The Ford specimens approximate closely to those from Folkestone.

The residues obtained by washing the clay consist chiefly of quartz-sand, together with grains of glauconite, limonite and other minerals. Many of the glauconite-grains are casts of Foraminifera, and broken tests of *Cristellaria*, *Pulvinulina*, etc., are often seen to be filled with glauconite. Some tests of Foraminifera are infilled with marcasite. The grains of glauconite often show a brown colour on the surface, due probably to decomposition, as these grains become green on boiling in dilute hydrochloric acid. Grains of garnet also occur, but are not abundant. Of the organic contents, Foraminifera are most abundant; ostracods, shell fragments and sponge-spicules are common, while echinid-spines and fish-teeth are also seen.

LIST OF THE FORAMINIFERA.

A=abundant; C=common; F=frequent; R=rare; V.R.=very rare.

	SPECIES.	Range in time.	Occurrence at Ford.
1.	<i>Nubecularia nodulosa</i> Chap. .	Gault	F.
2.	<i>Spiroloculina nitida</i> d'Orb. .	Middle Jurassic to Recent.	C.
3.	<i>Miliolina venusta</i> (Karrer) .	Gault to Recent . . .	C.
4.	" <i>tricarinata</i> (d'Orb.)	" "	F.
5.	" <i>ferussacii</i> (d'Orb.)	" "	C.

	SPECIES.	Range in time.	Occurrence at Ford.
6	<i>Reophax scorpionus</i> Montf. .	Oolite to Recent . .	V.R.
7	<i>Haplophragmium acutidorsatum</i> Hantken	Lower Greensand to Recent	F.
8	<i>Haplophragmium globigeriniforme</i> (P. & J.) .	Gault to Recent . .	R.
9	<i>Haplostiche shervorni</i> Chap. .	Gault to Chalk Marl . .	R.
10	<i>Thurammina albicans</i> Brady .	Jurassic to Recent . .	R.
11	<i>Ammodiscus incertus</i> (d'Orb.)	Carboniferous to Recent .	R.
12	" <i>milletianus</i> Chap.	Gault	R.
13	<i>Textularia minima</i> Berth. .	Lower Greensand to Gault	V.R.
14	" <i>trochus</i> d'Orb. .	Lower Greensand to Recent	F.
15	" <i>turris</i> d'Orb. .	" " " " . .	F.
16	" <i>conica</i> d'Orb. .	Gault to Recent " . .	F.
17	" <i>agglutinans</i> d'Orb. .	Carboniferous to Recent .	F.
18	" <i>prælonga</i> Reuss .	Lower Greensand to Chalk	R.
19	" <i>complanata</i> (Reuss)	Gault to Chalk Marl. .	C.
20	<i>Verneuilina triquetra</i> (Münst.)	Lower Greensand to Recent	R.
21	<i>Tritaxia tricarinata</i> Reuss .	" " " " . .	F.
22	" <i>pyramidata</i> Reuss .	Gault to Chalk " . .	R.
23	<i>Spiroplecta annectens</i> (P. & J.)	Lower Greensand to Recent	R.
24	" <i>complanata</i> (Reuss)	Gault	F.
25	<i>Gaudryina rugosa</i> d'Orb. .	Gault to Recent . .	R.
26	" <i>oxycona</i> Reuss .	Gault to Upper Chalk . .	R.
27	<i>Bulimina orbigny</i> Reuss .	Gault to Chalk . .	A.
28	" <i>murchisoniana</i> d'Orb.	Lower Greensand to Chalk	R.
29	" <i>obtusa</i> d'Orb. .	" " " " . .	R.
30	" <i>brevis</i> d'Orb. .	" " " " . .	R.
31	" <i>affinis</i> d'Orb. .	Lower Greensand to Recent	R.
32	<i>Pleurostomella obtusa</i> Berth. .	Gault	R.
33	" <i>alternans</i> Schwager	Gault to Recent. . .	F.
34	<i>Lagena globosa</i> (Montague) .	Silurian to Recent . .	R.
35	" <i>apiculata</i> Reuss .	Lias to Recent. . .	R.
36	" " var. <i>emaciata</i> Reuss	Gault	R.
37	" <i>gracillima</i> (Seguenza)	Gault to Recent . .	R.
38	" <i>hispida</i> Reuss .	Lias to Recent . .	R.
39	<i>Nodosaria</i> (G.) <i>humilis</i> Römer	Lias to Lower Eocene .	R.
40	" (G.) <i>mutabilis</i> (Reuss)	Lower Greensand to Chalk	R.
41	" (G.) <i>cylindræa</i> Reuss	Gault to Chalk . .	V.R.
42	" <i>radicula</i> (L.) var. <i>jonesi</i> Reuss	Gault	V.R.
43	" (D.) <i>farcimen</i> (Soldani) Reuss	Permian to Recent . .	R.
44	" (D.) <i>soluta</i> (Reuss)	Lias to Recent . .	R.
45	" " var. <i>pulchella</i> Chap.	Gault	V.R.
46	" (D.) <i>gracilis</i> (d'Orb)	Gault to Chalk . .	V.R.
47	" (D.) <i>lorneiiana</i> (d'Orb.)	Speeton Clay to Chalk .	F.
48	" (D.) <i>pauperata</i> (d'Orb.)	Lias to Recent . .	R.

	SPECIES.	Range in time.	Occurrence at Ford.
49	<i>Nodosaria</i> (D.) <i>consobrina</i> (d'Orb.)	Gault to Recent . .	R.
50	„ (D.) <i>cylindroides</i> (Reuss)	Gault to Chalk . .	R.
51	„ (D.) <i>hamulifera</i> Reuss	Lower Greensand to Gault	V.R.
52	„ (D.) <i>xiphoides</i> Reuss	„ „	V.R.
53	„ (D.) <i>legumen</i> Reuss	Speeton Clay to Chalk .	R.
54	„ (D.) <i>roemeri</i> (Neugeboren)	Speeton Clay to Recent .	R.
55	„ (D.) <i>communis</i> d'Orb.	Permian to Recent . .	R.
56	„ (D.) <i>mucronata</i> (Neugeboren)	Oolite to Recent . .	R.
57	„ (D.) <i>varistriata</i> Chap.	Gault	V.R.
58	„ <i>calomorpha</i> Reuss .	Speeton Clay to Recent .	R.
59	„ <i>hispida</i> d'Orb. .	Lias to Recent. . .	V.R.
60	„ <i>bambusa</i> Chap. .	Gault	V.R.
61	„ (D.) <i>intercellularis</i> Brady	Gault to Recent . .	V.R.
62	„ <i>sceptrum</i> Reuss .	Lower Greensand to Gault.	V.R.
63	„ (D.) <i>paupercula</i> .	Gault to Chalk . .	F.
64	„ (D.) <i>fontannesi</i> (Berth.)	Speeton Clay to Gault .	R.
65	„ (D.) <i>obscura</i> Reuss	Cretaceous	C.
66	„ (D.) <i>tenuicosta</i> Reuss	„	V.R.
67	„ <i>prismatica</i> Reuss .	Lower Greensand to Gault.	V.R.
68	„ <i>orthopleura</i> Reuss .	Gault	R.
69	„ <i>tetragona</i> Reuss .	Aptian to Gault . .	R.
70	<i>Lingulina nodosaria</i> Reuss .	Lower Cretaceous . .	V.R.
71	„ <i>semiornata</i> Reuss .	Lower Greensand to Chalk Marl	R.
72	<i>Fronidularia loryi</i> Berthelin	Gault	R.
73	„ <i>denticulocarinata</i> Chapman	„	V.R.
74	„ <i>gaultina</i> Reuss	Speeton Clay to Red Chalk	V.R.
75	„ <i>fritschii</i> Perner	Speeton Clay to Chalk .	F.
76	„ cf. <i>strigillata</i> Reuss	Gault	V.R.
77	„ <i>ungeri</i> Reuss .	„	R.
78	„ <i>parkeri</i> Reuss	„	R.
79	„ <i>planifolia</i> Chapman	„	R.
80	„ <i>guestphalica</i> Reuss	„	R.
81	„ <i>microdisca</i> Reuss	„	V.R.
82	„ <i>perovata</i> Chapman	„	R.
83	„ <i>cordai</i> Reuss .	Gault to Chalk . .	R.
84	<i>Rhabdogonium tricarinatum</i> (d'Orb.)	Lower Cretaceous . .	R.
85	„ <i>excavatum</i> Reuss	Gault to Chalk Marl. .	R.

	SPECIES.	Range in time.	Occurrence at Ford.
86	<i>Marginulina glabra</i> d'Orb. .	Rhaetic to Recent . .	R.
87	" <i>inæqualis</i> Reuss	Gault to Chalk Marl. .	V.R.
88	" <i>linearis</i> Reuss .	*Oxford Clay to Gault .	R.
89	" <i>debilis</i> Berthelin	Lower Greensand to Gault	V.R.
90	" <i>aequivoca</i> Reuss	" " " " " "	V.R.
91	" <i>striatocostata</i> "	Upper Jurassic to Recent .	R.
92	" <i>jonesi</i> Reuss .	Upper Jurassic to Chalk Marl	R.
93	<i>Vaginulina recta</i> Reuss .	Gault to Chalk Marl. .	C.
94	" <i>strigillata</i> (Reuss)	Lias to Chalk . . .	R.
95	" <i>truncata</i> Reuss .	Lower Greensand to Chalk Marl	C.
96	" <i>gaultina</i> Berthelin	Gault to Chalk . . .	V.R.
97	" <i>biochei</i> Berthelin	Gault	V.R.
98	" <i>priceana</i> Chapman	" " " " " "	R.
99	<i>Cristellaria exilis</i> Reuss .	Lower Cretaceous . . .	V.R.
100	" <i>parallela</i> Reuss .	" " " " " "	V.R.
101	" <i>humilis</i> Reuss .	Upper Jurassic and Lower Cretaceous	V.R.
102	" <i>crepidula</i> (F. & M.)	Lias to Recent. . . .	V.R.
103	" <i>navicula</i> d'Orb. .	Hartwell Clay to Chalk. .	V.R.
104	" <i>sulcifera</i> Reuss .	Hartwell Clay to Gault. .	V.R.
105	" <i>triangularis</i> d'Orb.	Gault to Chalk . . .	V.R.
106	" <i>trunculata</i> Berthelin	Gault	V.R.
107	" <i>scitula</i> Berthelin .	" " " " " "	R.
108	" <i>bononiensis</i> Berthelin.	" " " " " "	V.R.
109	" <i>italica</i> (DeFr.) .	Upper Jurassic to Recent .	R.
110	" <i>vestita</i> Berthelin .	Lower Greensand to Chalk	V.R.
111	" <i>complanata</i> Reuss .	Upper Jurassic to Cretaceous. . .	V.R.
112	" <i>bradyana</i> Chapman	Gault	V.R.
113	" <i>turgidula</i> Reuss .	" " " " " "	C.
114	" <i>circumcidanea</i> Berthelin	" " " " " "	V.R.
115	" <i>lobata</i> (Costa) .	Cretaceous and Tertiary .	F.
116	" <i>gibba</i> d'Orb. .	Lias to Recent. . . .	F.
117	" <i>convergens</i> Bornemann	Upper Jurassic to Recent .	V.R.
118	" <i>rotulata</i> (Lam.) .	Jurassic to Recent . . .	C.
119	" var. <i>macrodiscus</i> Reuss	Lower Cretaceous . . .	F.
120	" <i>gaultina</i> Berthelin	Cretaceous	C.
121	" <i>sternalis</i> Berthelin	Lower Cretaceous . . .	F.
122	" <i>diademata</i> Berthelin	" " " " " "	V.R.
123	<i>Polymorphina lactea</i> (W. & J.) var. <i>acuplacentata</i> (J. & C.)	Gault	V.R.
124	" <i>fusiformis</i> (Römer)	Lias to Recent	F.
125	" var. <i>horrida</i> Reuss	Gault to Oligocene . . .	R.
126	<i>Sagrina asperula</i> Chapman .	Gault	R.
127	" <i>calcarata</i> (Berthelin)	" " " " " "	V.R.

* Neaverson, MS.

	[SPECIES.]	Range in time.	Occurrence at Ford.
128	<i>Ramulina globulifera</i> Brady .	Jurassic to Recent . . .	F.
129	„ <i>aculeata</i> Wright .	Jurassic to Tertiary . . .	R.
130	<i>Globigerina cretacea</i> d'Orb. .	Lower Greensand to Recent	A.
131	<i>Discorbina rugosa</i> (d'Orb.) .	„ „	V.R.
132	<i>Anomalina anomonoides</i> (Reuss)	„ „	A.
133	<i>Pulvinulina elegans</i> (d'Orb.) .	Lias to Recent. . . .	R.
134	„ <i>caracolla</i> (Römer)	Lias to Gault	V.R.
135	„ <i>spinulifera</i> (Reuss)	Oolite to Gault	C.

MILIOLIDÆ.—*Miliolina venusta* is the commonest species of the porcellaneous group in the Gault of Ford. The common occurrence of *Spiroloculina nitida* is noteworthy, as it is very rare at Folkestone; Chapman records only one specimen from the Upper Gault. The porcellaneous Foraminifera from Folkestone seem practically to be confined to the Upper Gault.

ASTRORHIZIDÆ.—No representatives of this order have been found at Ford. The tests of many members of the group are incoherent, and this may account for their absence. It should be noted also that the Gault of Ford has been moved, during working, from its original position.

LITUOLIDÆ.—This group is not abundant in individuals, though several species occur. The commonest form is *Haplophragmium acutidorsatum*. One of the rarer species, *Haplostiche sherborni*, occurs at Folkestone only at the top of the Gault; thus its occurrence in the Lower Gault of Ford extends the known range of this form. *Reophax scorpiurus* also is restricted to the Upper Gault of Folkestone, but has also been recorded from the Speeton Clay of Yorkshire (R. L. Sherlock, *Geol. Mag.*, 1914, p. 221).

TEXTULARIIDÆ.—The genus *Textularia* is represented at Ford by seven species, but individuals are not common. *Bulimina orbigny* is the most abundant species, occurring in large numbers; at Folkestone it is common only in the Upper Gault.

LAGENIDÆ.—This order includes by far the largest number of species found at Ford, as also at Folkestone. The genus *Lagena* is only sparingly represented. The *Nodosariæ* comprise 31 species, of which *N. obscura* and *N. paupercula* are most abundant in individuals. *N. farcimen*, *N. soluta* and *N. varistriata* are restricted to the Upper Gault at Folkestone, but occur in the Lower Gault at Ford. *N. calomorpha*, which is found at Ford, is not recorded from Folkestone, but occurs in the Speeton Clay of Yorkshire. The *Froniculariæ* are not abundant in individuals, though ten species occur. *Rhabdogonium* is represented at Ford by two species which have been found only in the Upper Gault at Folkestone. *Vaginulina* is

abundantly represented by *V. recta* and *V. truncata*, whilst *V. strigillata*, *V. gaultina* and *V. priceana* also occur, the latter being restricted to the Upper Gault at Folkestone. Of *Cristellaria*, 24 species were found. The ensiform or elongate varieties are small and rare, but large forms of the *rotulata* type are commonly found, some individuals of *C. rotulata*, *C. gaultina* and *C. diademata* being among the largest of the Ford Foraminifera. *C. complanata* is restricted to the uppermost Gault at Folkestone, but it has been found by the authors in Upper Jurassic deposits in Buckinghamshire. The *Polymorphinae* are comparatively rare, but include some of the interesting fistulose forms. The *Ramulinae* occur as fragments—the usual state of these long branching forms.

GLOBIGERINIDÆ.—*Globigerina cretacea* occurs in great abundance; it is the commonest species found at Ford, with the possible exception of *Anomalina ammonoides*.

ROTALIIDÆ.—The genus *Discorbina* is represented by one species, *D. rugosa*. *Anomalina ammonoides* is very abundant, this species, together with *Globigerina cretacea*, making up more than half the Foraminifera in the Gault of Ford. The genus *Anomalina* is difficult to separate into species, but *A. ammonoides* appears to be the only representative at Ford. Of the *Pulvinulinae*, *P. spinulifera*, a variable species, is common, two other species being occasionally found.

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Mutilla europæa near Whitby.—I took a specimen of the parasite Ant, *Mutilla europæa* (Linn.), on the Whitby Moors, near Lilla Cross, on June 17th.—E. ARNOLD WALLIS, Scalby.

Pine Marten in Shropshire.—In *The Naturalist*, 1918, page 231, I noted that after a period of forty-five years—from 1862 to 1907—during which the Pine Marten had been regarded as extinct in Shropshire, two examples, both females, were trapped in April-May, 1907, and a third, also a female, in May, 1918. I now have to add a fourth specimen, trapped at Lutwyche, near Much Wenlock, 30th May, 1921. This is a male, and, judging by the teeth, not much more than a year old. I am pleased to say that the owner, Major G. R. Benson, has presented it to Shrewsbury Museum on my representing to him that it was the only species lacking to render the collection of Shropshire Mammals complete. The occurrences noted above not only confirm my view that the Marten has an innate love of roving—the Shropshire examples having probably come from Merioneth—but indicate that if given protection by large land-owners in wooded country, this graceful animal would once again resume its place in the local fauna.—H. E. FORREST, Shrewsbury.

THE MOSS FLORA OF HAGG WOOD, NEAR HUDDERSFIELD.

J. R. SIMPSON.

THE study of the distribution of the mosses of Hagg Wood, Honley, near Huddersfield, was suggested to me by Dr. T. W. Woodhead, and has been carried on since the autumn of 1917 until September, 1920.

The record consists mainly of common species, but the previous records for this part of south-west Yorkshire are scanty. In 'The Flora of West Yorkshire,' by F. Arnold Lees, 35 moss species for the Huddersfield district are recorded by Hobkirk, 6 by West, and 3 by Whitehead. In a MS. list of local mosses, prepared by C. P. Hobkirk, in the possession of Dr. Woodhead, I find 61 species recorded for the Colne and Holme Drainage areas. The main object of the study was to ascertain the composition of the moss flora of a typical sessile oakwood on the Millstone Grit series of rocks, and how the distribution is affected by proximity to a large industrial centre. The selection of Hagg Wood was determined largely by its accessibility, it being only a few hundred yards from my home.

Hagg Wood is situated on the gently sloping south-western banks of the River Holme, about $4\frac{1}{2}$ miles from Huddersfield, and it covers over 61 acres of ground. The altitude of the river is about 350 feet, and the highest point of the wood is only about 550 feet. The trees consist mainly of oak (*Quercus sessiliflora*), but the birch is well represented, and the mountain ash, beech and sycamore are not uncommon. One part is known as the 'Pine Wood,' and here the Scotch fir (*Pinus sylvestris*) is most in evidence, but the larch and spruce are also represented.

The main road to Manchester passes through the wood, dividing it about equally from north-west to south-east. A second division is made by a local road from Brockholes to Deanhouse and Oldfield, running from north-east to south-west. These roads are bordered by walls of local stone with mortared copings. A third division is made by the Deanhouse brook, which cuts off a small area to the south-east, and then for a few hundred yards forms the extreme south-east border. Another very small but very interesting water area is known locally as the 'frog pond,' which adjoins the river at Myholmbridge. This small pond is the only known habitat of *Sphagnum* in this area. Over a large area the bracken grows luxuriantly, with a consequent poor moss flora; in the pine wood, also, mosses are rare, and where found at all are never robust. A considerable area has reverted to the moorland

type of vegetation, and here the bilberry and the ling are much in evidence, with a corresponding moss flora on a limited scale. Almost in the centre of the wood there is a large quarry, which, until quite recently, had been long disused. In the older workings the moss flora is fairly rich and varied, but on the river-bank rock exposures the flora is disappointing, due, I believe, to quickly changing local conditions. The wall mosses vary in richness, probably owing to varying conditions of environment, *e.g.*, air currents and exposure. Speaking generally, the walls which face north-east are richest in mosses, but again, at one part the north-east exposure is almost devoid of mosses, whereas on the opposite side of the road, the wall is almost covered with living green, and there is, besides, a remarkable specific richness; that is, judged by a local standard, so that one finds it difficult to discover any governing law which is not liable to change in accordance with local conditions. In the present instance, I believe, the determining factor is the proximity of a large number of half-grown pines.

In the naming and arrangement of species I have followed 'The Students' Handbook of British Mosses,' by Dixon and Jameson.

The study has been of great personal interest, but unfortunately I have had to abandon the work on leaving the district. The results, therefore, are incomplete.

Specimens, mounted on cards, and also loose for examination, have been placed in the Tolson Memorial Museum, Huddersfield, along with full details of habitats.

I have to thank warmly Mr. W. H. Burrell, and Mr. Chris. A. Cheetham for their kind help in the work of identification. To Dr. T. W. Woodhead my thanks are due for his suggestive helpfulness, and his encouragement, especially during the early and difficult days.

HAGG WOOD MOSSES.

Sphagnum subsecundum var. *B. contortum* Schp. Pond side, semi-submerged.

Tetraphis pellucida Hedw. Distribution general, exposed tree-roots, tree stumps, and on the ground near the foot of trees.

Catharinea undulata Web. and Mohr. Distribution general, damp, shady ground.

Polytrichum aloides Hedw. Not common, damp clay in shady situations; rock fissures.

P. urnigerum L. Not common, damp and shady situations, flat rocks.

P. formosum Hedw. Not uncommon, but never typical growth; damp clay.

P. commune L. Not common, cinder path.

Ceratodon purpureus Brid. Very common, lime on walls, on the ground, tree stumps, etc., etc.; generally in fruit, and abundant.

Dicranella heteromalla Schp. Distribution general, damp clay, on rocks; a good fruiter.

- Campylopus flexuosus* Brid. Not uncommon, on boulders and on the ground.
- C. pyriformis* Brid. Not common, foot of a tree, in fruit.
- Dicranum scoparium* Hedw. Not common, growing amongst ling.
- Fissidens bryoides* Hedw. Distribution general, but never abundant, rock crevices, wall crannies, damp clay banks, generally in fruit.
- F. adiantoides* Hedw. Not common, shady clay bank.
- F. taxifolius* Hedw. Not common, rock fissure.
- Racomitrium fasciculare* Brid. Not common, flat exposed rock.
- R. heterostichum* Brid. Not common, wall top.
- R. lanuginosum* Brid. Not common, wall top.
- Ptychomitrium polyphyllum* Förn. Rare, wall top, in fruit.
- Tortula muralis* Hedw. Common on walls, on lime, and on crumbling sandstone; a good fruiter.
- T. subulata* Hedw. Not uncommon on walls; a good fruiter.
- Barbula rubella* Mitt. Not common, wall top, in fruit.
- B. fallax* Hedw. Common on walls, on stones, wall crannies.
- B. vinealis* Brid. Not common, on walls.
- B. convoluta* Hedw. Distribution general, on walls and on the ground.
- Funaria hygrometrica* Sibth. Very common on the ground in waste places, or where ground has been recently cleared by burning or wood clearing operations, on walls, and on cinder paths; an abundant fruiter; fruit very conspicuous when immature.
- Aulacomnium androgynum* Schwæg. Uncommon, wall crevices, rock fissures, tree stumps; numerous pseudopodia with minute balls of gemmae invariably present.
- Bartramia pomiformis* Hedw. Uncommon, on walls.
- Webera nutans* Hedw. Distribution general, in certain parts common, on the ground, under trees; a good fruiter.
- W. prolifera* Bryhn. Not uncommon, but never abundant, damp clay, walls, wall crannies, rock fissures.
- W. albicans* Schp. Rare, damp clay.
- Bryum caespiticium* L. Common on walls, on the ground; a good fruiter.
- B. capillare* L. Not uncommon, wall top, in fruit.
- B. argenteum* L. Rare in the wood proper and on the walls uncommon. In the immediate vicinity it is very common on walls, cement paths, at the foot of walls and buildings, generally barren, but often fruiting abundantly.
- Mnium cuspidatum* Hedw. Not common, on walls on soil.
- M. undulatum* L. Distribution general, but not common, damp, shady places on the ground, on stones.
- M. hornum* L. Distribution general and very common, probably the commonest moss in the wood, on the ground, often at the foot of trees, foot of walls, rock fissures, and in damp places; often found in fruit, but generally sterile.
- M. punctatum* L. Common in damp, shady situations, but never abundant, on stones and rocks.
- Brachythecium rutabulum* B. and S. Distribution general, very common on walls in damp places, but sometimes on dry wall tops, on stones, crumbling shale, etc.; a good fruiter.
- B. velutinum* B. and S. Distribution general; very common on walls and on stones; a good fruiter.
- Eurhynchium praelongum* Hobk. Never common, but well represented, amongst grass in damp and shady places, on stones and on walls; never found in fruit.
- E. Swartzii* Hobk. Not common, damp crumbling shale.
- E. rusciforme* Milde. Not common, on damp crumbling shale, and inside a water trough; in fruit.
- E. murale* Milde. Not common, on stones.

Eurhynchium confertum Milde. Distribution general, common on walls, on stones, and on tree stumps, generally in damp and shady places; a good fruiter.

Plagiothecium elegans Sull. Distribution general, common on walls, on boulders, and on the ground; never found in fruit.

P. denticulatum B. and S. Not common, on a rock face.

P. silvaticum B. and S. Not common, on stones, on the ground.

Amblystegium juratzkanum Schp. Not common, on stones.

A. filicinum De Not. Not common, on the ground.

Hypnum fluitans L. Rare, floating on pondwater.

H. cupressiforme L. Not common, rock face, damp and shady.

H. cuspidatum L. Not uncommon, rock face, and on the ground in damp and shady places.

HUDDERSFIELD DISTRICT MOSSES.

Dry Clough House Conservatory, Crosland Moor.

Catharinea undulata Web. and Mohr. Flower-pot.

Potia truncatula Lindb. On a wood slab, in fruit.

Leptobryum pyriforme Wils. Flower pot, sterile; also in fruit.

Wooldale Nurseries, Thongsbridge.

Funaria hygrometrica Sibth. Flower-pot, in fruit.

Leptobryum pyriforme Wils. Inside wall, 'Alpine' house, in fruit.

Hypnum ochraceum var. *B. flaccidum* Milde. Inside a stone water-trough.

Whitley Hall conservatory, near Huddersfield.

Leptobryum pyriforme Wels. Conservatory wall, inside.

Amblystegium juratzkanum Schp. Conservatory wall, inside.

Quarries in the rough rock at Shooters Nab, near Meltham.

Brachyodus trichodes Förn.

Schistostega osmundacea Mohr.

Hade Edge Moor, near Holmfirth.

Dicranum majus Turn.

Philonotis fontana Brid.

Dunford Bridge, near Holmfirth.

Webera albicans Schp. In a marshy place, in fruit.

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The Proceedings of the Liverpool Botanical Society, 1916-1918, have recently appeared, and by the aid of summaries of the Council's reports, and of the general and field meetings during the period named, the Society prevents a break in the continuity of the record of its doings. The Society includes among its membership the names of many important botanists who have contributed papers to the meetings. As frontispiece is a portrait of W. G. Travis, president during the period named.

Among the many valuable contents of *The Transactions of the Entomological Society of London*, issued in April, we notice 'The Full Grown Larva of *Lycaena euphemus* Hb.,' by T. A. Chapman; 'The Anthomyid Genera *Hammonyia* and *Hylephila* of Rondani (Diptera),' by J. E. Collin; 'The Interpretation of Insectan and Myriopodan Structures through a Comparison with the Structures of Crustacea,' by G. C. Crampton; and 'Description of the Female of *Chiasstosylla godfreyi* Waterst., with Notes on the Genus,' by James Waterston.

KEY TO THE HARPIDIROID HYPNA.

J. A. WHELDON.

(Continued from page 20).

(A) SCORPIDIUM (Schimp.) Limpr.

Leaves broad, concave, turgidly imbricate, more or less obtuse, apiculate-acuminate, or apiculate, often somewhat rugose when dry. Nerveless, or with a short forked nerve. Cells long, narrow, incrassate and porose. Auricles none, or of a few cells, not very distinct. Seta long. Annulus triple (where known). Dioicous.

1. Leaves homomallous, falcate-secund above forming a hooked cusp at stem apex (2). Leaves imbricate appressed: stems and branches turgidly julaceous, ending in a straight, or nearly straight, cusp (5).

2. Leaves broadly oval, blunt and apiculate or shortly cuspidate-subulate (3). Leaves narrower, oblong lanceolate, shortly acuminate-subulate, more distant, often regularly falcate-secund throughout (*S. scorpioides* var. *angustifolium*).

3. Stems elongate, slender, subsimple or pinnate, upper half of the leaf recurved (*S. scorpioides* var. *gracilescens*). Shorter, stout to very robust, irregularly, fastigiately branched, or imperfectly pinnate: leaves densely intricate, their points recurved (4).

4. Bright green above, brownish below (*S. scorpioides* var. *typicum* f. *virescens*). Yellowish above, soon fuscous or nigro-fuscous below (*S. scorpioides* var. *typicum* f. *fuscescens*). Blotched with rich purple red (*S. scorpioides* var. *typicum* f. *versicolor*).

5. Cells narrowly linear, about fifteen times as long as wide, almost uniform to base (6). Cells shorter and wider, upper elliptical linear five to eight times as long as wide, gradually becoming longer and linear rectangular below: alar cells rather numerous, wide, rectangular, forming indistinct, not inflated auricles (*S. turgescens*).

6. Plants rather short and slender, irregularly branched green or yellowish-green, passing to fuscous-yellow (*S. scorpioides* var. *julaceum* f. *flavovirens*). Subsimpler, with a few ascending weak branches: leaves very obtuse, oval, purpurecent (*S. scorpioides* var. *julaceum* f. *rubroinctum*). Robust, tall, simple or slightly branched: tips of stems fuscous-yellow, below brown to black (*S. scorpioides* var. *julaceum* f. *julgineum*).

(B) LIMPRICHTIA Loeske.

(*Harpidia intermedia* Sanio. *Intermedius-Gruppe* Warnst.
Vernicosus-Gruppe Roth.)

Leaves usually strongly falcate to circinate, uniform, entire, smooth or plicate. Nerved to middle, or beyond, but never excurrent. Lamina cells narrow, vermicular, thick walled and often porose, auricles absent. Inner perichaetial leaves sulcate. Annulus wide. Monoicous or dioicous.

1. Stem without central strand or differentiated epidermis: leaves rather shortly and widely acuminate, more or less distinctly plicate, nerved beyond middle (2). Stem with central strand and enlarged epidermal cells (4). Stem with central strand but without differentiated epidermis, 3-5 cm. high: leaves small, falcate, ovate lanceolate, acumen short and broad, nerve very strong (*L. latinerve*).

2. Stems erect, rigid, tufts yellow-green to rufous brown (5-10 cm. high): leaves plicate, concave, with a rapidly contracted short recurved canaliculate point: basal cells in several rows wider, hexagono-oblong,

often reddish (*L. vernicosa*). More robust, less rigid, green to brownish (10-25 cm. high) : leaves much larger (3).

3. Erect, stout and much branched : leaves dense, falcate secund (*L. vernicosa* var. *majus*). Floating, flaccid, and elongate, with few branches : leaves distant, less falcate (*L. vernicosa* var. *turgida*).

4. Dioicous or sterile, hardly glossy : cells in basal half of leaf partly parenchymatous (5). Monoicous, with metallic gloss : cells vermicular and prosenchymatous almost to base (12).

5. Leaves strongly plicate, usually reddish at base (*L. pellucidum*). Leaves not or hardly plicate (6).

6. Yellowish or greenish, rarely rufous : leaves often undulate when dry : leaf points rather short : cells rather thin walled, ten to fifteen times as long as wide or less, a few rows at base parenchymatous and wider (7). Dingy brownish green to brownish red : leaves larger, with a longer, often twisted and recurved subule : suprabasilar cells par and prosenchymatous intermixed (11).

7. Ochreous, tall and often pinnate : leaves rather rigidly falcate-secund, not crisped when dry (*L. intermedia* f. *falcata*). Leaves often undulate and crisped above when dry, less regularly falcate-secund (8).

8. Green or yellowish to brownish green (8). Purplish, or dark fuscous (10).

9. Stems moderate, rather dense leaved (*L. intermedia* f. *vera*). Stems slender, elongate, leaves distant (*L. intermedia* f. *remotiuscula*).

10. Stems slender : leaves of a rich purple red (*L. intermedia* f. *purpurea*). Robust, fuscous above, soon passing below to fuscous-black (*L. intermedia* f. *nigrescens*).

11. Tall and pinnate, brownish green to reddish : leaves dense, their points here and there patent and twisted (*L. intermedia* var. *Cossoni*). Elongate and slender, subsimple, spadiceous to yellowish green : stems wiry, often denuded below : leaves distant, with very long fine points, subcircinate, rarely at times spreading towards the apices (*L. intermedia* var. *Cossoni* f. *falcata*).

12. In soft fuscous-green, passing to rufous purple or blackish tufts : leaves large, densely crowded (*L. revolvens* f. *typica*). Slender, elongate, pinnate, ochreous to pale yellow : leaves smaller, rather distant.

(*L. revolvens* f. *flavescens*).

(C) SANONIA Loeske. Emend. Wheld.

Harpidia distincta Sanio. pp. *Uncinatus-Gruppe* Warnst.

Mesophyte to subxerophyte. Stems frequently rhizinose ; cortical cells dilated. Leaves elongate, plicate, with a relatively narrow nerve reaching above halfway. Areolation delicate, cells long, flexuose ; the basal angles forming rather small but distinct hyaline auricles. Perichaetial leaves very long, appressed, plicate. Capsule annulate. Inflorescence autoicous.

Loeske, following Sanio, includes *Hypnum fertile* here. Its affinities appear to be with *Stereodon* rather than *Sanonia*, and the definition of the genus given above excludes it.

1. Robust to very robust, erect, simple or slightly irregularly branched : leaves from a broad erect oblong base, nearly straight, or the acuminate points only recurved, entire, or feebly denticulate above : capsule erect, or inclined and feebly curved (2). Less robust, sub-pinnately branched : leaves narrower, more strongly acuminate, falcate-secund, with long often loriform subulate points : capsule arcuate, except in var. *alpinum* (3).

2. Leaves densely imbricate, erect, points of stems and branches straight (*S. orthothecioides* f. *orthophylla*). Leaves from an erect base, subfalcate-secund, cuspidate points of stems and branches curved (*S. orthothecioides* f. *subfalcata*).

3. Procumbent or ascending, moderately robust, with few rhizoids : leaves strongly plicate, denticulate (4). Prostrate or creeping, in flat patches : under side of stem radiculose (5).

4. Apices of stems feebly hooked : leaves only slightly striate (*S. uncinata* var. *abbreviata*). Apices strongly hooked : leaves strongly plicate, often to base (7).

6. Leaves large and rather wide, with a very long subule : capsule regular, erect (*S. uncinata* var. *alpina*). Leaves moderate (2.5-3.5 mm.) narrower, subule shorter : capsule oblique, arcuate (*S. uncinata* var. *sueta*).

7. Leaves 3 to 4 mm. long, of which the very long loriform cubule forms about half (8). More slender and delicate : leaves 1-3 mm. long (9).

8. Capsule oblique, arcuate (*S. uncinata* var. *sueta* f. *plumosa*). Capsule cylindrical, erect and symmetrical : pedicels often geminate (*S. symmetrica*).

9. Very slender, and creeping, and radiculose throughout : leaves 2-3 mm. \times .6 mm. : seta short and capsule small (*S. uncinata* var. *plumulosa*). Still smaller, delicate as *H. sommerfeltii*, creeping, up to 5 cm. long, here and there attached by scattered tufts of radicles : leaves 1-2 \times .5 mm., plicæ and serratures nearly obsolete (*S. uncinata* var. *contigua*).

(D) CRATONEURON Schimp.

Erect, ascending or prostrate, usually more or less pinnately branched. Stems clothed with paraphyllia and frequently tomentose. Leaves falcate-secund, base excavate. Tissue usually solid, cells linear, gradually shorter towards leaf base, at decurrent angles suddenly wider, subhexagonal, forming hyaline or coloured auricles. Nerve thick. Dioicous. The British forms consist of one polymorphous species, *C. commutatum* (Hedw.), which may for convenience be divided into the following subspecies or 'micro-species,' and varieties.

1. Leaves more or less papillose : stems slender, pinnate, with short subequal hooked branches : perigonial bracts papillose (*C. decipiens*). Leaves and bracts never papillose (2).

2. Very neat and slender : leaves very small, 1.5 mm. long, or shorter (3). More robust : leaves larger, 1.5 to 3 mm. long (7).

3. Plant alpine or subalpine (4). Plant of lower altitudes (6).

4. Pale yellowish green, to yellowish brown (5). Dark deep green, fuscous below : straight leaves, 1.5 \times 5-6 mm. : nerve 49 u. : medium cells 36-38 u., basal about 23 u. long : paraphyllia abundant, and amongst them a few scattered rhizoids (*C. gracilentum*).

5. Paraphyllia many, radicles few or none : leaves ovate rather suddenly or more gradually, tapering, but always wider and shorter than the next : strongly plicate, their texture thin, delicate and translucent, cells short (4-6 times as long as wide) : nerve broad but thin, short, ending at or just beyond mid-leaf (*C. sulcatum*). Deeper coloured, less pinnate, glossy, paraphyllia and rhizoids few : leaves longer and proportionately narrower, striate (hardly plicate) : cells longer and narrower, less delicate and translucent : nerve more solid, reaching $3/4$ (*C. gracilescens*).

6. Plant of sphagnum moors, slender, soft, 5-10 cm. high : leaves lax, rather long and narrow (1-1.5 mm. long) : alar yellow, translucent, with thin walls : paraphyllia very slender, few, and radicles few and scattered (*C. falcatum* var. *delicatulum*). Plant of shallow sand-dune pools : short (3-5 cm.), yellow or ochreous brown, much branched but hardly pinnate : leaves short and broad (.9-1 mm. long), auricles yellow, opaque, their cell walls incrassate (*C. falcatum* var. *dunale*).

7. Divisions of stem closely and complanately pinnate, pinnæ slender : rufous tomentum usually mixed with the abundant paraphyllia : leaves of stem and branches strongly dimorphous : stem leaves from a

cordate-triangular base, rather suddenly narrowed and finely acuminate, branch leaves more or less flexuose when dry : alar cells variable, colourless or yellowish, usually hyaline, their walls but little incrassate (8). Branches more irregular and distant, often elongate, ascending and stem-like, subfasciculate : stems scarcely tomentose, with few rhizoids, and scattered paraphyllia : leaves of stem and branches less strongly dimorphous, those of stem from a narrower, more elongate base, more gradually narrowed to a wider acumen : branch leaves hardly flexuose, more rigidly falcate-secund : cells longer, texture more solid : auricles coloured, often opaque, with more incrassate cell walls (10).

8. Greenish, yellowish or fulvous, ochraceous below, more or less closely plumosely pinnate : stems with dense rufous tomentum (*C. glaucum*). Green : leaves more rigid, and more strongly nerved (9).

9. Lively light green, pallid and often lime encrusted below, often creeping and irregularly pinnate : rhizoids abundant on undersides of stem : plant of wet calcareous rocks and tufa (*C. glaucum* var. *fontanum*). Dusky olive green, tall (10-20 cm.), stout or rather slender, rather closely and regularly pinnate above, and often throughout : stems with many paraphyllia and a few rhizoids, sometimes denuded below : leaves rather narrower, approaching the 'falcatum' shape, and branches also stout : nerve 76-82 μ wide at base (*C. glaucum* var. *subirrigatum*).

10. Dark to blackish-green : stems with very few scattered slender paraphyllia or none, and no tomentum, often denuded of leaves below, and bristly with the persistent remains of the very stout nerves : nerve very thick (at base 100-130 μ), remaining very stout throughout, and percurrent or lost in the point (*C. irrigatum*). Nerve more slender and more tapering (60-80 μ at base), less engaged in the acumen : stems not denuded below (11).

11. Very tall (10-25 cm. high), bright yellow or ochraceous, with the colour and habit of a very robust *Drepanocladus Wilsoni* : irregularly pinnate, the branches often long and ascending at an acute angle : leaves dense, falcate-secund, their points often flexuose-spreading, 2-3 mm. long : nerve 60-70 μ wide (*C. falcatum* var. *speciosum*). Less robust, and shorter (5-15 cm.), dusky green, yellowish-green to brown (12).

12. Tall or short, very variable, but usually paler and less rigid than the next : leaves with a comparatively short and wide acumen, 2-2.5 mm. long (*C. falcatum*). Short and stout (5-10 cm.), fuscous-yellow above passing immediately to brown and black below : leaves about 2 mm. long, very densely imbricate, circinate-secund, with a longer and finer acumen : nerve solid, brown, 70-80 μ wide at base : resembles in habit *Limprichtia revolvens* (*C. falcatum* var. *alpinum*).

(To be continued).

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As Hull Museum Publication No. 96, an index of the publications 48 to 95, has been issued, which will be useful to those using these publications. The first 47 publications had previously been indexed. The index is not a wonderful example of typography, but we suppose this is a sign of the times.

Leicestershire, by G. N. Pingriff, Cambridge University Press ; 164 pp., 3/6 net. We regret that the notice of this useful publication has been delayed. Its appearance aids towards the completion of the well-known Cambridge County monographs. For the articles on natural history and geology, with which we are more concerned, the author is indebted to the *British Association Guide* to the district. There is a fine series of illustrations.

J. WILFRID JACKSON. Lancs., Yorks.
On a New Middle Carboniferous Nautiloid (*Coelonautilus trapezoidalis*). *Mem. and Proc. Manch. Lit. and Phil. Soc.*, Vol. LXIII., pp. 1-4.

T. A. JONES. Lancs. S., Cheshire.
Liverpool Geological Society [report of meeting of]. *Lancs. and Cheshire Naturalist*, April, p. 269.

T. A. JONES. Lancs. S., Cheshire.
The Pebbles of the Middle Bunter Sandstones of the Neighbourhood of Liverpool. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 281-308. Notice in *The Naturalist*, Aug., p. 245-246.

T. A. JONES. Lancs., Cheshire.
Notes on Some Borings recently made in Wirral and in Liverpool. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 339-345.

T. A. JONES. Lancs., Cheshire.
Additional Petrographical Studies of Local Erratics. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 347-354.

T. A. JONES. Lancs. S.
Description of a Boring in the Lower Coal Measures and Millstone Grit near Billinge, Lancashire. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 409-412.

P. F. KENDALL. Yorks., Notts.
[Sigillaria, etc., in Coal Measures: in Discussion on D. Davies' Paper]. *Abs. Proc. Geol. Soc.*, No. 1060, p. 9.

[P. F.] K[ENDALL]. Lancs., Cheshire.
Source of Trias Rock-materials. Bunter Pebbles, of French Origin? [Notice of Papers by W. Hewitt, H. W. Greenwood and T. A. Jones]. *The Naturalist*, Aug., pp. 245-246.

ALFRED SANTER KENNARD. See C. T. TRECHMANN.

PHILIP LAKE and R. H. RASTALL. Northern Counties.
A Text-book of Geology, 3rd edition, pp. xiv.+508+33 plates.

GEORGE WILLIAM LAMPLUGH. Yorks., Derby., Notts.
The Anniversary Address of the President: The Structure of the Weald and Analogous Tracts. *Quart. Journ. Geol. Soc.*, Vol. LXXV., pt. 1, pp. li.-xcv.

G. W. LAMPLUGH. Northern Counties.
Anniversary Address of the President. Some Features of the Pleistocene Glaciation of England. *Quart. Journ. Geol. Soc.*, Vol. LXXVI., pp. xviii.-lxxxiii. Abs. in *Nature*, March 11th, p. 58; *The Naturalist*, April, pp. 115-117.

G. W. LAMPLUGH, C. B. WEDD and J. PRINGLE. Yorks., Lincs.
Special Reports on the Mineral Resources of Great Britain. Vol. XII., Iron Ores (Contd.); Bedded Ores of the Lias, Oolites, and Later Formations in England, pp. iv. + 240. Review by 'R.H.R.' in *Geol. Mag.*, May, 1921., pp. 230-231.

G. W. LAMPLUGH. See ANON.

H. LOUIS. Northern Counties.
British Iron Ores [Review of Geological Survey Special Reports, Vols. VIII., IX., X.] *Nature*, Jan. 1st, pp. 429-431.

HENRY LOUIS. See D. A. E. EVANS.

F. T. MAIDWELL. Lancs., Cheshire.

The Bellevalle Borehole [abstract]. *Lancs. and Ches. Nat.*, June, p. 319. *Geol. Mag.*, June, p. 285.

F. T. MAIDWELL. Cheshire.

Some Borings through the Marshes bordering the Southern shore of the Mersey Estuary. *Proc. Liverpool Geol. Soc.* Vol. XII., pt. 4, pp. 417-418.

ALLEN MAWER. North'd, Durham.

The Place-Names of Northumberland and Durham. Cambridge, xxxviii. + 271.

SIDNEY MELMORE. Lake District.

The Metamorphism of the Carrock Fell Gabbro ; with a Note on the Origin of the Sulphide Veins of the Caldbeck Fells. *Geol. Mag.*, June, pp. 266-268.

HENRY B. MILNER. Derbyshire.

British and Colonial Petroleum Resources : A Review of the Present Oil Situation. *Discovery*, Aug., pp. 238-244.

J. H. MILTON. Lancs., Yorks.

President's Address [1916 : Palæozoic Corals]. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 265-280.

J. H. MILTON. Lancs., Yorks.

Presidential Address [1917 : Brachiopoda]. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 313-324.

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Proceedings of the Liverpool Geological Society [Oct. 10th, 1916, to April 1st, 1919 ; various exhibits]. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. iv.-xvi.

JOHN FREDERICK MUSHAM. Lincs.

Check List of Non-Marine Mollusca [includes 'sub-fossil' forms]. *Trans. Linc. Nat. Union*, 1919, pp. 79-101.

E. D. NICHOLSON. Lake District, Cheshire.

Geological Denudation. *Quarry*, June, pp. 147-151.

FREDERICK JOHN NORTH. Northern Counties.

On Syringothyris Winchell and Certain Carboniferous Brachiopoda referred to Spiriferina D'Orbigny. *Quart. Journ. Geol. Soc.*, Nov., pp. 162-227. Abs. in *Nature*, Jan. 29th, p. 586.

HENRY PRESTON. Lincs.

Geology : Sub-fossil shells in the Witham Valley. *Linc. Nat. Union Trans.*, 1919 [publ. 1920], pp. 41-42.

J. PRINGLE. See G. W. LAMPLUGH.

R. H. R[ASTALL]. Lake District, etc.

Special Reports on the Mineral Resources of Great Britain, Vol. VIII., Iron Ores ; . . . by Bernard Smith [Review of ; see under 1919]. *Geol. Mag.*, Jan., pp. 37-38.

R. H. RASTALL. See PHILIP LAKE.

- ELEANOR MARY REID. Durham.
On Two Pre-glacial Floras from Castle Eden (County Durham).
 [Abstract]. *Quart. Journ. Geol. Soc.*, Nov., pp. 104-144; Abs.
Proc. Geol. Soc. London, No. 1053, pp. 60-61; *The Naturalist*,
 May, pp. 147-148; *Nature*, April 22nd, pp. 249-250.
- ELEANOR MARY REID. Durham.
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- ELEANOR MARY REID. See C. T. TRECHMANN.
- W. ALFRED RICHARDSON. Notts
The Fibrous Gypsum of Nottinghamshire. *Min. Mag.*, Dec., pp. 77-95. Abs. in *Nature*, July 1st, pp. 569-570; *The Naturalist*, Sept., p. 280; *Geol. Mag.*, Aug., p. 379.
- HENRY CRUNDEN SARGENT. Derbyshire.
The Lower Carboniferous Chert-Formations of Derbyshire.
 [Abstract.] Abs. *Proc. Geol. Soc.*, No. 1051, March 4th, pp. 47-51; and *Nature*, March 11th, p. 58.
- A. SCOTT. See F. BARKE.
- HENRY DUKINFELD SCOTT. Northern Counties.
Studies in Fossil Botany. 3rd edition. Vol. I. Pteridophyta. pp. 457.
- JAMES HENRY SEQUEIRA. See BERTRAM BLOUNT.
- T. SHEPPARD. Northern Counties.
Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1919. *The Naturalist*, February, pp. 67-71, March, pp. 108-111.
- T. SHEPPARD. Yorks., Lake Dist.
The Origin of the Materials used in the Manufacture of Pre-historic Stone Weapons in East Yorkshire. *Trans. East Riding Antiq. Soc.*, Vol. XXIII., pp. 34-54. Abs. in *The Naturalist*, May, pp. 146-147.
- T. FRANKLIN SIBLY. Derby., Lancs., Yorks.
On the Distribution of Productus humerosus (-sublaevis) and the Zonal Range of the ' Brachiopod Beds ' of the Midlands. *Geol. Mag.*, Jan., pp. 20-22.
- BERNARD SMITH. Cumberland, Furness.
Pre-Triassic Swallow-holes in the Haematite District of Furness, Lancs.; a Glimpse of an Ancient Landscape. *Geol. Mag.*, Jan., pp. 16-18.
- BERNARD SMITH. See R. H. R[ASTALL].
- L. J. S[PENCER, and others]. Northern Counties.
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- L. J. S[PENCER]. See BERTRAM BLOUNT.
- H. G. STOKES. See F. C. HARDINGE.

- G. S. SWEETING. Northern Counties.
An Index to the Proceedings of the Geologists' Association, Vols. XXI. to XXX., 1909-1919, with a Chronological List of the Longer Excursions. 44 pp.
- C. B. TRAVIS. Lancs., Cheshire.
Coastal Changes at the Alt Mouth. *Proc. Liverpool Geol. Soc.*, Vol. XIII., pt. 1, pp. 52-64. Abs. in *Geol. Mag.*, June, p. 285; *Lancs. and Chesh. Nat.*, June, p. 319.
- C. B. TRAVIS. Lancs. S.
Note on Terminal Curvature at Billinge Hill, St. Helens. *Proc. Liverpool Geol. Soc.*, Vol. XII., pt. 4, pp. 309-312.
- CHARLES TAYLOR TRECHMANN. Northumberland, Durham.
On a Deposit of Interglacial Loess, and Some Transported Pre-glacial Freshwater Clays on the Durham Coast. [With Appendices by E. M. Reid, H. H. Dixon, A. S. Kennard, B. B. Woodward, C. W. Andrews and M. A. C. Hinton]. *Quart. Journ. Geol. Soc.*, Vol. LXXV., pt. 3. No. 299, pp. 173-203.
- A. E. TRUEMAN. Lincolnshire.
The Ammonite Siphuncle. *Geol. Mag.*, Jan., pp. 26-32.
- ARTHUR E. TRUEMAN. See ARTHUR HUBERT COX.
- G. W. TYRRELL. Northern Counties.
Geology. [Review of Recent Memoirs]. *Science Progress*, April, pp. 567-572; July, 1920, pp. 24-29.
- C. B. WEDD. See G. W. LAMPLUGH.
- W. H. WHEELER. Lincs.
A History of the Fens of South Lincolnshire, Being a Description of the Rivers Witham and Welland and their Estuary, and an Account of the Reclamation, Drainage and Enclosure of the Fens adjacent thereto. Second edition, pp. 489+43+14+15+17+4+31+5.
- LEONARD J. WILLS. Cheshire.
The Geology of the Llangollen District. *Proc. Geol. Assoc.*, Vol. XXXI., pt. 1, pp. 1-15.
- LEONARD J. WILLS. Cheshire.
Long Excursion to Llangollen, August 16th to 23rd, 1919. *Proc. Geol. Assoc.*, Vol. XXXI., pt. 1, pp. 16-25.
- E. ADRIAN WOODRUFFE-PEACOCK. Yorks., Lincs. N.
The Ecology of Thorne Waste. *The Naturalist*. Sept., pp. 301-304; Nov., pp. 353-356; Dec., pp. 381-384.
- BERNARD BARHAM WOODWARD. See C. T. TRECHMANN.
- DAVID WOOLACOTT. Yorks., Durham.
On an Exposure of Sands and Gravels containing Marine Shells at Easington, co. Durham. *Geol. Mag.*, July, pp. 307-311.

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C. H. Hooper writes on 'Pollination of Fruits,' and E. S. Salmon on 'Hop Mould and its Control,' in *The Journal of the Ministry of Agriculture* for May, and in the same publication for June Tichner Edwardes refers to the Modern Bee-Hive: its Defects and Possibilities.

FIELD NOTES.

BIRDS.

Early Arrival of the Swift and Cuckoo.—I first heard the cuckoo calling this year on April 18th, at 6 a.m. This is the earliest date upon which I have heard him in this district. On April 29th, I saw a single Swift flying above my house at 8-30 p.m.; on the 30th there were several more. I have never previously known the Swift to arrive in Harrogate in April.—R. FORTUNE.

Turtle Doves near Allerton.—When travelling by road from York to Harrogate on June 8th, I put up four turtle doves from a turnip field on the outskirts of Allerton Park. These birds are to be found in the country round Harrogate almost every year, odd pairs only, and seldom in the same place two years in succession. It seems to point to desire on the part of these birds to extend their range northwards, as in other portions of Yorkshire they appear to have become regular summer visitors.—R. FORTUNE.

Kestrel and Rabbits.—In several newspapers, a report appeared in which it was stated that Capt. C. W. Knight, in one of his lectures, said that he took thirty young rabbits from a Kestrel's nest. This was pretty widely copied, and gave one writer of game notes the opportunity of slanging the Kestrel in a thorough manner. Capt. Knight states that what he said was that once he found the remains of thirty young rabbits in a Buzzard's nest. As a rule, when the daily or weekly popular press deal with natural history matters, they make a pretty hash of it.—R. FORTUNE.

Osprey in Nidderdale.—On May 27th, during my absence from home, a telegram came from Mr. Charles Barlow, of Pateley Bridge, 'Mature Osprey on Gouthwaite to-day.' I went over as soon as I could in the hopes of seeing the bird, but was not successful. Mr. Barlow informed me he first saw the bird, which was in full adult plumage, on the mud at the top of the reservoir. He brought Major Smith, of Rams-gill, to see it, and upon their return the bird was on the wing; it made two stoops, causing a splash, but he could not see whether it obtained a fish or not. In the afternoon it had disappeared and has not been seen since. It was badly mobbed all the time it was on the wing by about a dozen black-headed gulls.—R. FORTUNE.

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The Quarterly Journal of the Geological Society of London, No. 305, contains a paper on the Arctic Flora of the Cam Valley at Barnwell, Cambridge, by Miss M. E. J. Chandler; a note on *Archimylacris pringlei*, sp. nov. by Mr. H. Bolton; the anniversary address of the President, etc. The insect remains described by Mr. Bolton were obtained from the Keele measures of Shropshire by Mr. J. Pringle.

CORRESPONDENCE.

COCK BLACKBIRD FEEDING YOUNG ROBINS.

Towards the end of March a pair of Robins built in a small box I had put up last year on a wall of my house. The first egg was laid about March 26th. On April 13th a pair of Blackbirds built on the roof of the same box, which was the site of their nest last year (though the Robins did *not* build in the box last year). The first Blackbird's egg was laid on April 19th. On April 22nd I noticed the cock Blackbird chasing the old Robins away whenever they tried to go to their nest, which by now contained young birds. At last the cock Blackbird could stand it no longer, and he deliberately perched in front of the hole in the box and dared the robins to come in. He must then have heard the young ones inside, as he turned round and looked in—looked very surprised—had another look—flew off—and a moment after I saw him on the lawn breaking up a large worm into small pieces. I waited until he had got his beak full of the bits, and then went back to the other window from which I could see the two nests—about 3 yards away. Back he came, went straight to the hole in the box and fed the young robins! He continued doing this for about a week, occasionally giving a worm to his own hen, sitting on her nest just above. It really seemed as though he thought the young robins were his own brood, and had dropped through into the box from the nest above! The parent robins also fed them whenever they got the chance. When the young robins were nearly fledged they appeared to be afraid of the blackbird, and would not take any more food from him. He came out of the box with the worm still in his beak and gave it to his hen on the nest.

The young robins left the nest on May 1st, the young blackbirds on May 20th.

There is a robin sitting in an old kettle in one of my rustic arches, and a blackbird with four eggs (yesterday) about two yards away, higher up in the same arch, but I am not sure whether they are the same pairs respectively.

My garden is full of young Blue Tits to-day which left their nest (in an old stone filter in a tree) yesterday evening. One of them perched quite happily on my finger to-day, and flew back again on to my hand when I had put in on an apple tree.—E. W. MAULE COLE, Hillside, Northiam, Sussex, May 30th.

Those of us who are in the habit of using tents or hides for photographing birds, know that it is not an uncommon occurrence for other birds, besides the parents, to take a hand at helping to feed a hungry brood.—R.F.

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G. P. Phibbs figures and describes 'Variations in the segmental spines of the fourth-stage larva of *Hypoderma bovis* (the warble-fly) in *The Irish Naturalist* for May.

Referring to our remarks on *Discovery* (1920, pp. 83, 118-119), the editor, Dr. Russell, now finds that he must retire from the editorship of that magazine. We believe the publication will continue to appear.

We learn from *The Geological Magazine* for June that 'owing to the large number of important original papers now to hand, it has been found impossible to spare even one page for Editorial Notes.' The number is principally occupied by papers dealing with Australia, China, etc.

Mr. C. Carus-Wilson illustrates in *Nature* the outline of an organism which he states is a beetle and that the 'clavate and merismatic antennae are very conspicuous.' Professor Cole makes a reasonable suggestion that the remains are of a radiolarian, but Mr. Wilson is not convinced, though he does not explain how the antennae indicated could possibly be embedded in a nodule formed at the bottom of the sea.

NORTHERN NEWS.

Mr. T. A. Coward has been elected president of the Manchester Literary and Philosophical Society.

Dr. R. R. Gates has been appointed to the University Chair of Botany at King's College, London.

We hear that Prof. Kendall's services are to be retained by the Leeds University for another year.

The death is announced of W. Warde Fowler, of Oxford, author of several popular books on birds.

Mr. James E. Bedford, F.G.S., of Leeds, has been elected a member of the Society of Antiquaries of London.

The Linnean gold medal of the Linnean Society—its highest award—has been presented to Dr. Dukenfield H. Scott.

The Public Libraries, Art Gallery and Museums Committee of Rochdale are to be congratulated on issuing their 50th Annual Report.

D. M. S. Watson describes *Eugyrinus wildi* A. S. W., a Branchiosaur from the Lancashire Coal measures, in No. 680 of *The Geological Magazine*.

We see that a 'Waggoner's Barrel, oak, with four iron hoops, 8 ft. 2 inches by 8½ diam.', has been presented to the Warrington Museum. Some barrel.

The Seventieth and Seventy-first Annual Reports of the Ipswich Museum have been received, and include references to the additions to the collection and to changes in the staff.

'Morphogenesis of Brachiopoda: *Reticularia lineata* (Martin), Carboniferous Limestone,' by W. E. Alkins, appears in *Memoirs Manchester Literary and Philosophical Society*, Vol. LXIV., pt. 1.

Mr. T. A. Coward and Mr. J. Wilfred Jackson, whose work in connexion with the Museum at the Manchester University is well-known, have recently received the degree of M.Sc. at the Manchester University.

The trustees of the British Museum have appointed Dr. W. T. Calman, D.Sc., F.R.S., deputy-keeper in the Department of Zoology. Dr. Calman has been in charge of the crustacea at the Natural History Museum since 1904.

The arrangements are well in hand in connection with the British Association Meeting at Edinburgh, September 7th-14th next, and already announcements have been made of many important papers and discussions.

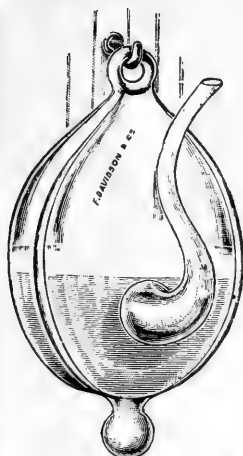
Besides reports of the Club's excursions, *The Proceedings of the Liverpool Naturalists' Field Club* for 1920, recently issued, contain an illustrated presidential address by J. J. Lewis, on 'English Church Woodwork.'

D. E. Minnick (*Journ. Experimental Zool.*, XXXIII., 1921, No. 1) has found that Vanissid butterflies (*V. atalanta* and *V. antiopa*) have hitherto unknown sense organs in the tarsi of their four walking legs by which they can distinguish between e.g., apple juice and water or salt solution and sugar solution.

'A First Record for Great Britain of the Greater Snow Goose,' by Dr. W. Eagle Clarke; 'Small Birds in the Garden,' by G. Bolam; 'The Walrus in British Waters,' by J. Ritchie; 'Scottish Bark Beetles,' by J. W. Munro; and 'Diptera Nematocera from Arran, etc.,' by F. W. Edwards, appear in *The Scottish Naturalist* for May.

The abstracts of papers read and annual reports of the Brighton and Hove Natural History and Philosophical Society, for 1919-1920, recently issued, contain a portrait and memoir of the late J. C. Haselwood; Ald. C. Thomas-Stanford, M.P., on 'The Appreciation of Natural Scenery'; Mr. H. S. Toms in a note states that *Helix Memoralis* (sic.) 'formed a regular article of diet among the Romano-Britons of Wilts. and Dorset.' The 'evidence' in favour of this statement would be of interest.

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July 1st, 1921.

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A MONTHLY ILLUSTRATED JOURNAL OF
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EDITED BY

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The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,

Technical College, Huddersfield,

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G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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THE MARINE BIOLOGY COMMITTEE will hold its Annual Meeting at Robin Hood's Bay and at Scarborough, from 1st September to 5th September, 1921.

All the time will be spent at Robin Hood's Bay, with the exception of an excursion to the South Bay at Scarborough, on Monday, 5th September.

Will members intending to be present please write to the convener for details.

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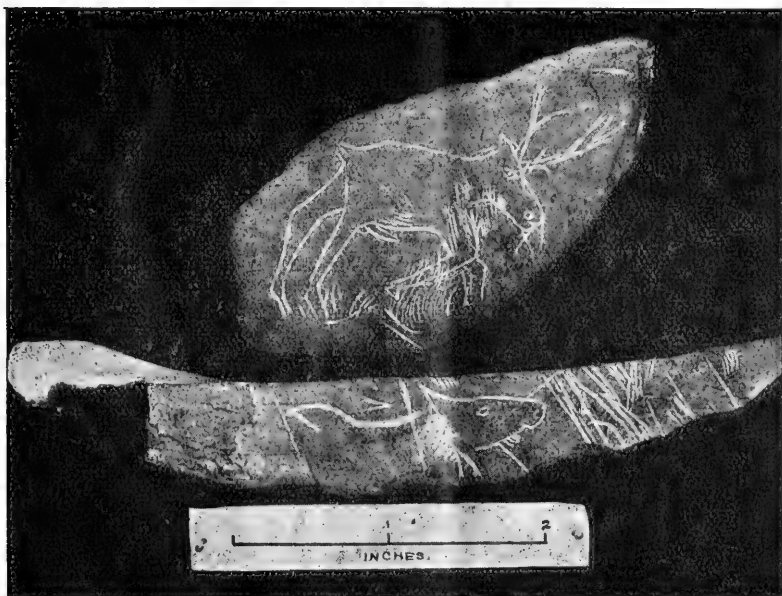
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NOTES AND COMMENTS.

THE ANTIQUARIES JOURNAL.

Part 2 of *The Antiquaries Journal* contains a report of a paper and discussion relating to the discovery of some Flints upon which have been scratched representations of animals. A photograph of the principal examples is reproduced, and by the courtesy of the Editor of that publication we are able to put it before our readers. The discovery was made by Mr. Leslie Armstrong while excavating in the famous Grimes Graves in Norfolk. As will be seen, scratched upon the



weathered surfaces of Flint nodules are representations of Elks.

GRIMES GRAVES.

A similar paper to that in *The Antiquaries Journal* was recently read at a joint meeting of the Anthropological Society and the Prehistoric Society of East Anglia, in London, when the present writer had an opportunity of suggesting that in view of the past achievements of some of the members of the Prehistoric Society, great caution should be exercised before accepting the scratchings as of human work of very old date. He considered that there was certainly a catch somewhere. If the drawing was of palæolithic date, it is difficult to understand how it can possibly have been associated with the Grimes Graves, which the special report issued by the Society

of East Anglia seems to indicate are distinctly either of the Neolithic or Bronze Age.

SCRATCHES ON FLINT.

Further, the scratches are made on the outer white coat of the flint nodules, and having regard to the age attributed to them, these would surely have disappeared by ordinary denuding agencies long ere this, as the white coatings of the nodules are comparatively soft and, of course, the scratchings do not enter the flint proper. It is also difficult to conceive the nature of the implement used in making the scratches, especially the small circles on the noses and the representations of eyes, though this particular argument is not pressed. One of the pieces of flint in the illustration is obviously a fractured piece, presumably broken since the time the drawing was made, in which case it seems exceptionally lucky that the Elk head just happens to be retained unbroken.

ELK AND DEER.

Also, if palæolithic man drew these animals, and with such anatomical care and accuracy as is shown, surely he would have not made the error of representing antlers of a Red Deer upon the head of an Elk. (Since these particular remarks were made at the meeting referred to, I find Mr. Reginald Smith draws attention to this same anomaly—see page 85 of *The Antiquaries Journal*—Mr. Smith's words are: 'The engraving is not a portrait, and there might be a difference of opinion as to the animal represented. The long legs and short body were in favour of the Elk, but it was difficult to believe that the massive palmated antlers of that animal escaped the notice of the artist who had produced something more like those of a Red Deer').

A CATCH.

With Mr. Reginald Smith I agree that a palæolithic man, who was clever enough to represent the unmistakable characters of an Elk so finely and with so few strokes, would not have made the grievous error of adorning the animal with antlers of another beast altogether. I do not for a moment wish to suggest that Mr. Leslie Armstrong has done other than give us an accurate description of what he considers he has found, but I can only repeat that there seems to be a catch somewhere. In the discussion which followed, Sir Ray Lankester did state that a careful examination of the actual scratches on the flints did not seem to show that the animals were so cleverly drawn as represented in the photograph, which is a photograph of the Chinese White infillings of the cracks, made presumably by the author for the better reproduction of the photographs.

THE GOATSTONE.

With this extraordinary title Mr. Reginald Smith described a piece of liver-coloured quartzite, from which a flake had been broken, probably by a plough, and had been picked up by a collector and placed in his cabinet merely because of the nature of the stone. While a friend happened to be looking through this particular cabinet he noticed some cracks formed as a result of the flake, and with a little imagination it might possibly be assumed that these were in the form of a dancing Goat with its nose in the air. On the other hand, with the same imagination it might be considered as representing as great a variety of objects as one can see faces in a fire. But to suggest for one moment that upon this stone was graven, by human hands in probably palæolithic times, a representation of a Goat, or any other animal, is simply absurd. In the first place, the stone itself could not possibly be carved in the way shown by any implement in the possession of palæolithic man, and in the second place any geologist could explain the accidental resemblance to a mythical animal by the ordinary process of flaking, just as the bulb of percussion in Flints frequently resembles a cockle shell. To produce this particular object at the same meeting as the alleged palæolithic drawings on the Flint nodules did not help matters, and while much was made of the fact that some geologists considered the stone to be Sandstone and others considered it to be quartzite, the fact remains that the alleged Goat is purely a natural feature which has not the advantage even of resembling a Goat.

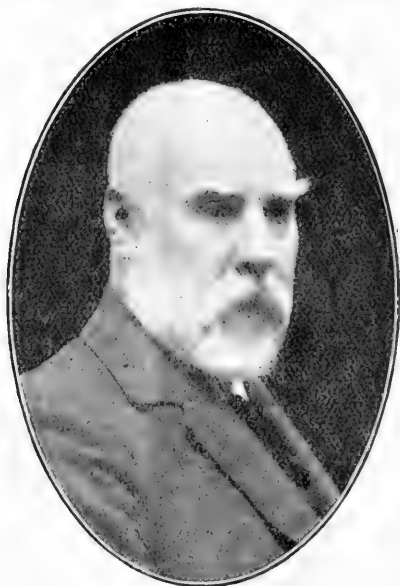
MORE MOIR.

J. R. Moir, in *Nature* for June 9th, describes two flint implements found *in situ* in the surface of the ferruginous 'pan' or stone bed resting on the chalk at Cromer. He refers to the alleged geological age of the pan, speaks of ochreous artefacts, bulbar surfaces, radiating fissures, *écaillage*, and, as usual, to his own previous publications. But for all that the great geological age of specimens found embedded *in the surface* of a ferruginous pan is open to question. A little while ago, on the beach at Flamborough, a small mass of ferruginous conglomerate was found in which, thoroughly embedded, was a typical neolithic 'scraper' as well as several beach pebbles. The 'conglomerate' proved to be formed upon a horse-shoe, but no one assumed that the horse-shoe was neolithic in date or that the scraper was made during the past fifty years. More recently, on an excursion to South Ferriby, firmly embedded in a ferruginous 'pan' at the base of the boulder clay cliff, was a trousers button. It had to be broken out. But no Yorkshire Geologist has yet written to

Nature endeavouring to prove that pre-glacial men in the Humber district wore trousers.

JOHN RAY HARDY.

Through the courtesy of Mr. R. Standen we are able to give our readers a portrait of the late J. R. Hardy, whose services at the Manchester Museum are well known. Mr. Hardy was born at Nether Hallam, in Yorkshire, in 1844, and as Mr. Standen, in his memoir referred to elsewhere,



states 'Of powerful physique, Mr. Hardy was a good all-round athlete, an expert with rod and gun, and an excellent swimmer. He was an excellent taxidermist and osteologist, a keen ornithologist and entomologist, with a special liking for Beetles, which were, first and always, his chief favourites, and a group in which he made many important discoveries.'

WILLIAM SMITH.

In 'William Smith, His Maps and Memoirs,' published by the Yorkshire Geological Society recently, an effort was made to bring together particulars of all the portraits, busts,

etc., relating to the 'Father of English geology.' While passing the time in the surgery of Dr. Evan Fraser, at Hull, recently, the writer noticed a large engraving on the wall entitled 'The distinguished Men of Science of Great Britain living in the years 1807/8, designed by Gilbert and drawn



by F. Skill and W. Walker, London, 4th June, 1862, published by W. Walker & Son, 64 Margaret St., Cavendish Square, engraved by W. Walker and G. Zöbal, printed by T. Brooker.' This was a composite group, and occupying a prominent position was a portrait of William Smith, standing, which was new to me. By Dr. Evan Fraser's courtesy this has been photographed, and Smith's portrait is reproduced herewith, from which it seems clear that the artist has taken the features

of William Smith from the plate appearing as frontispiece to Phillips' Memoirs published in 1844. The artist has apparently not been personally familiar with Smith, and has made him much more tall and slender than that gentlemen existed in real life. Beneath the portrait is a facsimile of his signature, which is quite typical.

A NORTH SEA MARVEL.

Under the above perfectly correct heading, the Hull press publishes the following note :—' During the war the waters off the coast of Denmark, in which fishing could be carried on without danger, were overfished, and it was ascertained the area would be practically depopulated of fish. Dr. Petersen, of the Danish Fisheries Board, has discovered that, though the intensive fishing practically exterminated the old type of fish, *Nature, in her eagerness to keep pace with the depletion caused by intensive trawling, has actually created a new species of plaice, which is quick growing, lusty, and nearly double the weight of its predecessors.*'

DR. W. H. PEARSALL.

Readers of *The Naturalist* will be glad to join us in sincerely congratulating one of the secretaries of the Yorkshire Naturalists' Union, Mr W. H. Pearsall, on his receiving the degree of Doctor of Science from the Manchester University, for his work on the Vegetation of the English Lakes. Of this work 'The Aquatic Vegetation of the English Lakes' appeared in *The Journal of Ecology*, Vol. VIII, and 'The Development of Vegetation in the English Lakes considered in relation to the General Evolution of Glacial Lakes and Rock Basins.' was read before the Royal Society recently, and will appear in their *Proceedings* in due course. The remainder still awaits publication.

THE YORK MUSEUM.

The Annual Report of the Yorkshire Philosophical Society for 1920 has recently appeared, and besides the usual references to the progress of the institution, are some illustrated notes on Later Tertiary Invertebrata, by Alfred Bell. In this Mr. Bell revises a general synopsis of the Crustacea and Echinodermata of the Upper Tertiaries which he put before the Society in 1891. In the general report, reference is made to the fact that the York Museum really began by the necessity for finding of a home for the Mammalian Remains from Kirkdale Cave, and a similar collection from the same cavern found its way to Hull and has been on exhibition there since about 1822, the date of the foundation of the York Society. A recent visit to the York Museum indicates that the institution is being thoroughly overhauled by the new curator, Dr. Collinge.

THORBURN'S 'BRITISH MAMMALS.'

Close upon the heels of the first volume of this sumptuous work appears volume 2, which in every way equals the first one in the character of its letterpress and the charm of the illustrations. Mr. Thorburn's illustrations of the Black Rat in this volume are of particular interest to northern naturalists, while the various species of Vole, Hare and Deer are illustrated in his inimitable manner. The Mammals include the Whale, Porpoise and other marine species, and we find illustrations of these, though on account of the necessarily great reductions in sizes, we do not like these quite so well as the representations of the land Mammals.

A HAWK RING.

In *The Naturalist* for March 1914 we illustrated a pair of silver Hawk rings which had been found on the Humber shore. The Hull Museum has now acquired a further ring, in silver,



evidently of the same period as the other. The present example is engraved 'Sr Arthur Chichester' on one side, and 'Lo Deputie' on the other. Sir Arthur Chichester was Deputy Lord of Ireland in 1604.

THE PLUMAGE BILL.

We learn from the Secretary of the Plumage Bill Group that 'the first four sittings of the Committee showed the opposition that it was beaten, and it came to terms in May. The "concessions" we gave them will not save the wretched feather traders, but they do save the honourable gentlemen who have fought against us from acknowledging themselves utterly beaten. We have allowed them nine months, instead of six, as the period to intervene between passing the Act and the Act coming into force. We have also agreed to the establishment of a committee to advise the Board of Trade as to the possibility of adding to the schedule of the Bill the names of any other birds, besides Ostrich and Eider-duck, whose plumage may be imported. The committee will consist of 10 members, of whom 3 will represent the trade interest, 2 will be ornithologists, and the other 5 will be independent persons appointed by the Board of Trade. In short, we may expect that 7 of the 10 will be, generally speaking, on the side of the bird protection. The Bill went safely through its final stages in the House of Commons in June. There

was quite a good House—about 150 members, and no opposition from the enemy. A strengthening amendment to prevent women from bringing plumage into the country in their baggage was added.'

THE EXCESSIVE COST OF PRINTING.

We learn from *The Publishers' Circular* that 'a memorandum for the Printing and Publishing Firms of Great Britain' has recently been issued by a number of officers of literary societies and librarians of libraries not supported by State funds, with the object of impressing on the printing and publishing firms in question the danger they are incurring by enforcing the recent enormous increase in the price of books and in the cost of printing generally. The distinguished signatories of this document point out that it is to the public detriment that learned societies should be forced to cut down their output of proceedings and monographs, and that libraries should have to reduce to a minimum the number of books they purchase. They also point out that if learned societies are unable to continue their series of publications there will be less work for the printers.' We should like to draw the attention of printers and others concerned at Hull and elsewhere to this matter.

THE BOURNEMOUTH REPORT.

The British Association report for 1919 (Bournemouth meeting) has appeared. We found this out quite recently by accident, in an attempt to correct a statement made by the British Association itself as to its reports. It seems that the report was duly printed, but was only sent out to those who asked for it, and as none of the members were then informed that an application was necessary, presumably very few reports have been circulated. In the following year, certainly, we were advised that it was necessary to apply for a report, and the necessity for these applications, we believe, has saved many volumes. As a member of the British Association for many years, and a keen collector of scientific literature of this description, we must admit it came as a surprise to us that a Report should be printed and published in the year 1920 of which we had no knowledge, and to which no reference whatever seems to have been made in any publication in this country, or anywhere else.

UNRELIABLE RECORDS.

The Yorkshire Post recently gave a lengthy account of Neolithic Man in Yorkshire, based entirely on a report of the discovery of some human remains at Grassington, while removing sand from a gravel pit. It was stated that the 'local antiquary' had no doubt about the fact that they were remains of Neo-

lithic Man, in confirmation of which a flint scraper had been picked up 'on the site.' *The Naturalist*, from time to time in recent years has drawn attention to the unreliable nature of reports dealing with natural history, geology and archaeology, and has protested. In some cases the papers are of such a character that unreliable records may be expected from them, but in the case of *The Yorkshire Post*, matters are different, and its usually reliable records have given us confidence with regard to any new discoveries it announces. For this reason it is all the more surprising to find that the following letter which had been sent to them by 'Antiquary' has not been considered suitable for publication in the *Journal*. 'Antiquary' tells us that the Editor has written to him in connection with the letter, but the fact that no correction of the alleged extraordinary discovery, as reported, has appeared, is hardly what we should have expected from *The Yorkshire Post*.

NEOLITHIC MAN IN YORKSHIRE.

'Referring to the lengthy report of the Grassington "discovery" in your issue of this morning: would it not be better if, before reports of this character were published, some competent authority was consulted. In the present case there is not a scrap of evidence that the skeleton found is Neolithic, and the probability is the skeleton is very much more recent in date. The fact that a flint 'scraper,' whatever that may be, was found on the site, is nothing to go by. As a matter of fact, Neolithic or New Stone Age Burials are exceedingly rare. Mortimer, who opened considerably over 300 pre-historic graves did not, so far as I remember, find a single Neolithic Burial; they were all of the Bronze Age and later. I doubt very much whether an authentic Neolithic Burial has occurred in Yorkshire, though at the moment I am writing from memory. It would be interesting to know what the "certain facts" are which point distinctly to the Neolithic date of the recent find. Yours etc., "Antiquary."'

A ROEBUCK MEMORIAL.

The current number of *The Journal of Conchology* (Vol. XVI., No. 6) is a "Roebuck Memorial Number," and is occupied with an account of the distribution of land and fresh-water mollusca in the British Isles, based on the 59,000 authenticated records collected by the late Denison Roebuck from 1877 till his death in 1919. The facts are given in tables under 153 topographical divisions, and are also shown in more than 150 small maps, and should be of great interest to students of geographical distribution as well as to conchologists. It is to be hoped that the publication will stimulate naturalists to deal with other groups in the same way, and so

make the mass of data which must exist in individual collections of more general use. Copies may be obtained from the Secretary of the Conchological Society, University Museum, Manchester, price five shillings.

THE MUSEUMS ASSOCIATION.

During the hottest week of this hot summer, *i.e.*, July 12th to 18th, the Museums Association held its Thirty-second Annual Conference in Paris—the members carrying out the somewhat extensive programme in an atmosphere resembling that of a Turkish Bath, and in a city where the supply of soda-water and lemonade fell far short of the demand.

SIR FREDERICK G. KENYON, K.C.B.

The visitors, as well as their colleagues in Paris, were honoured in having as President the Director of the British Museum, Sir Frederick Kenyon, who gave various interesting reminiscences and opinions in his address on the first day, making special reference to his views as to the future policy and improvements of the British Museum.

THE MEETINGS.

The meetings were principally held in the lecture theatre of the Natural National History Museum; the Director, M. Mangin, and Prof. Vayssière, President of the French Museum Association, and Dr. Loir, of the Havre Museum, gave the visitors a hearty welcome. The lecture list was not quite so lengthy as usual, but, in the circumstances, seemed quite long enough, and it was not altogether a disadvantage that some of the discussions had to be curtailed. Among the papers were 'The Development of American Museums of Art,' by Mr. L. E. Rowe; 'The System of Registration of Specimens at the National Museum of Wales,' by Dr. W. E. Hoyle. 'The Function of Art Museums,' by Messrs. Lawrence Haward, I. J. Williams and T. C. F. Brothie.

FRENCH MUSEUMS.

The chief charm of the Conference, however, was the opportunity afforded of visiting the wealth of Museums and Galleries in Paris, under the personal guidance of the respective directors, in addition to which opportunities were afforded of examining collections not usually available to the public. In this way the National Natural History Museum, the Botanical Museum, the Mineralogical Museum, and the Jardin des Plantes, the Cluny Museum, the Louvre and its various galleries, the 'Autour du Monde,' the Hotel de Ville and the Salle des Fêtes, the Petit Palace and its Museums, the Hotel des Invalides and the Army Museum, Versailles and its collections, the Chateau and Museum of St. Germain and Malmaison, were all examined.

ENTERTAINMENTS.

The members were well entertained. There were receptions at the National Natural History Museum, at the Louvre, at 'Autour du Monde,' at the Hotel de Ville; there was the Annual Dinner at the Hotel Moderne; the Dinner of 'The Order'; and a Conference with the French Museums Association. In addition, opportunities were afforded of seeing Paris at its best—the National Fête taking place during the meeting, though on account of the hot weather the famous Military Review at Longchamps, to which the party was invited, was postponed. The Conference was quite successful, and the visitors were much impressed by the prominent position occupied by the Museums and Galleries in the life of the Gay City.



Wayside Trees and How to know them, by **Forster Robson**. London: Thornton Butterworth & Co., pp. 125, 7s. 6d. net. Popular books on trees are endless, and, as in this case, admittedly written for those who desire to know the names of common species met with in a country walk. It is to be hoped that some good will result from their perusal, and that they will influence those who devote their youthful energies to destroying the trees in our parks and woodlands. Mr. Robson has aimed at helping those without knowledge of botany to name a tree without preliminary study. This is done by grouping the species according to the form of their leaves, by descriptions in simple language, and by a considerable number of carefully-drawn figures of leaf forms, twigs and buds, also excellent sketches showing the general habit of the commoner species. There is an index in which the seventy-two species described in the text are arranged in their families.

The Handbook of British Lichens, by **Annie Lorrain Smith, F.L.S.**, and printed by order of the Trustees of the British Museum, is the title of another book on these fascinating plants, and well worth the acceptance of young students in this branch of Botany. It is a portable guide to the determination of British Species, and based upon the Monograph of British Lichens by the same author (see *The Naturalist*, 1918, p. 399). It is simply a 'boiled down' edition of the Monograph, which had 928 pages and 130 plates, costing 50/-; to a handy pocket book of 158 pages and 90 excellent illustrations of exceptional clearness and good draughtsmanship, for 6/-. It has suffered nothing in the 'boiling down' process, excepting the elimination of the Geographical distribution of the species, which in the case of Lichens, owing to their universal world wide distribution, is not of such vital importance as in Flowering Plants controlled by climatic conditions. It has indeed materially gained in flavour by the process, bringing into prominence valuable generic and specific keys which enable workers to recognise their plants easily. It also contains about a dozen new species not included in the Monograph, unfortunately omitting to state where detailed description can be found, these new species being distinguished by letters *a* or *b* after the serial number referring to the Monograph. There is an introduction of 13 pages dealing with the Lichen plant as a whole, of valuable information, and quite up to date, but we note a slight omission in the Algæ constituents on page 4, wherein *Dactylococcus* should appear as the associate of *Solorina* and *Peltidea*, and *Microcystis* as that of *Coriscium* and *Pyrenidiaceæ*, though they appear

later in the description of the Genera. Lichenology hitherto has been a difficult branch of Botany, but this little handbook goes far to make the field knowledge of lichens accessible to the ordinary student, and of more than ordinary value to those interested in the study of Mycology, so closely and enthusiastically followed by members of the Yorkshire Naturalists' Union.—THOMAS HEBDEN.

Some Birds of the Country Side : The Art of Nature, by H. J. Massingham. London : T. Fisher Unwin, 208 pages, 12/6. In this volume have been brought together articles which have appeared in *The Contemporary Review*, and other publications ; dealing with 'The Coast of Wales,' 'The Flats,' 'A City of Birds,' 'Gilbert White and Selborne,' 'Bird-haunted London,' 'A Dorset Diary,' 'A Village in Hampshire' and 'Charles Waterton.' The author is well known in the literary world, and has a fascinating style. The chapter dealing with Charles Waterton appeals particularly to Northern naturalists, inasmuch as Waterton was a Yorkshireman and had a Bird Sanctuary on his estate near Wakefield.

The Resources of the Sea, by W. C. MacIntosh. Cambridge University Press, 35/-. A second edition of Professor MacIntosh's well-known work has been called for, and has been produced in the way we usually expect from this house. The sub-title, 'As shown in the scientific experiments to test the effects of Trawling and of the Closure of certain areas off the Scottish Shores,' indicates the lines upon which the book is prepared, and from the publishers' announcement we gather that 'this work is the result of many years' observation in the department of the fisheries, especially since the Royal Commission on Trawling under Lord Dalhousie.' The conclusions to which the author has been led are similar to those formerly reached by Professor Huxley, Lord Eversley, Sir Spencer Walpole, Professor Van Beneden and others, from a totally different standpoint. Every fact bearing on the solution of the question has been as exhaustively dealt with as possible, both in text and tables. A chapter on the labours of the costly International Fisheries Council has been added, and the whole work brought up to date. The work is illustrated by various half-tone plates and wood-cuts, though some of the former are rather worn.

An Introduction to the Structure and Reproduction of Plants, by Drs. F. E. Fritsch and E. J. Salisbury. London, Bell & Son, pp. vi and 458, 15/- net. Those familiar with the work of the authors in their respective departments of botany will expect to find this book thorough and reliable. In these respects they will not be disappointed. A first glance gives a good impression from the numerous, excellent and well chosen figures. A more careful perusal justifies their claim to have written a book for those who desire to learn something of the role of plants in nature ; of their structure and mode of life rather than an examination text-book. The usual study of selected types has been abandoned in favour of a more general account indicating the range of form and reproductive methods within each group. In the hands of a capable teacher this is sound, but otherwise there is the danger of a general and superficial knowledge replacing more exact and detailed methods of study. A particularly successful part of the book deals with ecological anatomy, and the treatment of physiology in relation to structure. A less convincing claim is that features of plant anatomy and plant chemistry of commercial importance are emphasised throughout. The work concludes with a short but helpful chapter on heredity and evolution, and an appendix on the microscope and methods of section cutting, staining, reagents and mounting, also a bibliography of well selected books for those desirous of extending their knowledge of the various branches of the subject. Teachers and students alike will find this book a most valuable aid in their studies.

PLANT GALL FORAY AT LEEDS.

WM. FALCONER, F.E.S.

THE first sectional field day of the newly constituted Plant Gall section of the Union was held at Leeds on May 28th last, mainly—although incidental kinds were not neglected—for the investigation of the spring forms of the Cynipid galls of the oak. Every member present was supplied with a list of the latter, containing brief descriptions sufficient for the identification of those likely to be met with and their location, and was able to engage with zest in a systematic search. In the result a most interesting and successful day was spent; in the morning in Roundhay Park *via* the open-air baths, the far side of the Waterloo Lake and the Gorge to the Mansion; in the afternoon a slightly increased party proceeded by way of King Lane and King Wood to Adel Moor. Altogether forty-three different forms were observed. Some fully expected to occur on the oak were not in evidence, in some instances because the male catkins were not only very scarce, but also too high up on the trees for examination. A local species of 'greenfly' was found on the fly honeysuckle, and Mr. Dallman drew attention to another on the dog's mercury, which is not yet on the British Gall List, and which he has noted elsewhere in Yorkshire and Wales. The creeping buttercup was noticed in one place to have one 'leaflet' of its trifoliolate leaf a little deformed and thickened in a plane slightly varying from the normal and decidedly smaller than the corresponding one on the other side. This deformation was seen to be due to *Aphrophora spumaria* Linn. In the Huddersfield district I have found on several occasions a very distinct shortening of the floral axis and a resultant massing of the flowers in the dock sorrel, also caused by the same insect, which is accepted on the Continent as a true gall-agent, and there is no reason why, with such unmistakable examples before us, they should not be recognised as such in this country. Two or three other noteworthy forms are described and commented on in the list. One of them, *Phyllocoptes epiphyllus* Nal., would appear to be commoner and more widely distributed than is usually supposed, but is overlooked.

The acarid and aphid material was taken home and subjected to microscopical examination to verify the presence of the gall mites in the former, and the stages of development of the greenfly in the latter.

The abbreviations employed are:—AC.=Acari; DIP.=Diptera; HEM.=Hemiptera; HOM.=Homoptera; HYM.=Hymenoptera; FUN.=Fungi; *Q. sess.* and *Q. ped.*=*Q. sessiliflora* and *pedunculata*, the two common varieties of the oak.

THE OAK.

- AC. *Eriophyes* (?) spec. *Q. ped*; rows of long spaced abnormal hairs, and numerous very minute, elongated red pimples of the nature of swollen hairs on the leaf midribs; the latter also on the blade in their immediate vicinity; the gall mites themselves exceptionally elongated. The lane along the base of King Wood.
- DIP. *Arnoldia quercicola* Kieff. *Q. ped.*; in the same lane. The enlarged buds contained both white and red larvae.
Macrodiplosis dryobia F. Löw. *Q. sess.*; near the baths, Roundhay Park.
- HOM. *Callipterus quercus* Kalt. *Q. sess*; in the same place as the last. *Q. ped*; lane at the foot of King Wood.
- HYM. *Andricus curvator* Htg. *Q. sess*; curved leaf gall, old examples, the Gorge. *Q. ped.*; new ones, in the lane at the foot of King Wood.
A. pilosus Adlr. f. *fecundator* Cam. *Q. sess*; the Gorge. *Q. ped*; King Wood. Both last year's.
A. trilineatus Htg. *Q. ped.*; above the Gorge, Roundhay Park and King Wood.
Biorrhiza pallida Oliv. *Q. ped.*; King Wood.
Cynips kollari Htg. *Q. sess.*; Roundhay Park. Last year's.
Cynips (?) spec., Houard, No. 1210. Greenish yellow to pale yellow brown ovoid galls, with thin woody walls, minute, completely concealed within the basal portion of a bud, the only outward indication of their presence usually being the round perforation in the side of the bud made by the escaping imago, although there is sometimes a slight torsion apparent. The remains of the galls are like eggs with the tops removed. The distribution is given as the British Isles and Austria, and the agent concerned is stated to be *Neuroterus defectus* Htg. or *N. politus* Htg., or *Andricus punctatus* Bignell.
Q. ped.; in the lane along the base of King Wood. The peculiarity in this case was that there were two galls side by side within an enlarged bud of *Arnoldia quercicola* Kieff. I have known the gall for two years as it is abundant in Boothroyd Wood and less so elsewhere in the Huddersfield district, and have bred out the flies which are awaiting identification.
Dryophanta taschenbergi Schl. *Q. ped.*; the 'purple velvet bud'; the Gorge.
Neuroterus baccarum Linn. *Q. sess et ped.*; Roundhay Park and Adel. Abundant on the leaves.

SPRUCE.

- HOM. *Chermes abietis* Kalt. Roundhay Park, old galls.

WILLOW (*Salix aurita* L.).

- AC. *Eriophyes tetanothrix* Nal. Adel Bog and lower down the stream.
Eriophyes (?) spec. Adel Bog. Houard, S.56; been previously recorded for England on the above willow, although not given as occurring on it in the work cited. I have also noted it in Honley Old Wood, Huddersfield.
- DIP. *Rhabdophaga rosaria* H. Löw. Adel Bog, last year's.

ASPEN.

- AC. *Eriophyes varius* Nal. 'Felt' on under surface of leaf, very plentiful and mites very much in evidence, Nanny Bridge in King Lane; all the bushes seemed to be affected.

BIRCH.

- AC. *Eriophyes rudis* Can. 'Big bud,' King Wood, Adel Moor and Roundhay Park. In the latter place, the axis of the buds was lengthened and the scales in consequence separated and loosened, giving the galls a very unusual appearance, due, most probably, to the swarms of mites present producing greater excitation and growth.
- DIP. *Contarinia betulicola* Kieff. Adel Moor.
Massalongia rubra Kieff. Adel Moor. Just beginning.
Oligotrophus betulæ Winn. King Wood.

ALDER.

- AC. *Eriophyes brevitarisus* Fckn. Waterloo Lake and the Gorge, Roundhay Park.
E. nalepai Fckn. Waterloo Lake and the Gorge, Roundhay Park.
E. laevis Nal. The Gorge and Adel Moor.
- FUN. *Exoascus alnitorquus* Winter. 'Leaf blister,' the Gorge.
Frankiella alni R. Maire. The Gorge, affecting the roots.

HAZEL.

- AC. *Eriophyes avellanae* Nal. 'Big bud,' Roundhay Park.

WYCH ELM.

- HOM. *Schizoneura ulmi* Linn. Roundhay Park. Queen and young present.

CREEPING BUTTERCUP.

- HEM. *Aphrophora spumaria* Linn. Roundhay Park (see p. 269).

BLACKTHORN.

- HOM. *Aphis padi* Linn. Roundhay Park and Adel; apterous females.

MOUNTAIN ASH.

- AC. *Eriophyes pyri* Pgnst. Adel Bog.
HOM. *Aphis sorbi* Kalt. The Gorge, Roundhay Park.

DOG'S MERCURY.

- HOM. *Aphid* (?) spec. Torsion of midrib of leaf in some cases; margin at one pointed abruptly twisted and a portion of the blade turned loosely upwards, sometimes exposing the lower surface; upper surface slightly puffed.

SYCAMORE.

- AC. *Eriophyes macrochelus* Nal. Roundhay Park.

SYCAMORE AND MAPLE.

- AC. *Phyllocoptes gymnaspsis* Nal. Roundhay Park; in both cases the gall mites observed.

ASH.

- AC. *Phyllocoptes epiphyllus* Nal. Roundhay Park and Adel; the mites noted. I have seen it also in many places about Huddersfield, and in N. Wales.
- HOM. *Psyllopsis fraxini* Linn. Roundhay Park and Adel, just beginning, but every indication that it would be as abundant in these places as it is elsewhere.

MINT.

- FUN. *Puccinia menthae* Pers. Just within the Gorge, reported by Mr. F. A. Mason as being present.

YELLOW ARCHANGEL.

- DIP. *Perrisia galeobdolonitis* Winn. Plentiful on subterranean shoots, the Gorge.

GUELDER ROSE.

- HOM. *Aphis viburni* Scop. The Gorge, Roundhay Park, and below the Seven Arches, Adel. Most of the trees seen were very badly affected.

HONEYSUCKLE.

- DIP. *Perrisia periclymeni* Rübs. On the common honeysuckle, one low trailing bush, 3 examples, village side of Adel Bog.
 HOM. *Siphocoryne xylostei* Schrk. On the leaves of the fly honeysuckle, abundant, below the mansion, at the bend leading to the far side of the Upper Lake. Pupae and winged females were represented. A local species.

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Fabre, Poet of Science, by C. V. Legros. T. Fisher Unwin, 352 pages, 8/6. Dr. Legros' work was originally printed in 1913, and has reached a large circle of Fabre's admirers. The volume is now reprinted, and gives a very charming account of the life story of one of the finest natural history writers the world has ever produced.

Stones and Quarries, by J. Allen Howe. London: Sir Isaac Pitman & Son, 137 pp., 3/- net. This little volume is one of Pitman's Common Commodities and Industries Series and is evidently the work of an expert. He deals with the various varieties of stone and the numerous ways in which these are extracted from the pits. There are descriptions of the numerous limestones, sandstones, slates, etc., with remarks as to their suitability for different classes of work.

The West Riding of Yorkshire, by Bernard Hobson. Cambridge University Press: 188 pp., 4/6 net. Mr. Bernard Hobson is well known as an enthusiastic geologist, and in the present contribution he has not suppressed his favourite hobby. With the help of Mr. Godfrey Bingley's charming photographs, and contributions in the Victoria County History, the author has supplemented his own knowledge and presented a volume quite in keeping with the rest of the Cambridge County History series.

Catalogue of the Fossil Bryozoa (Polyzoa) in the Department of Geology, British Museum (Natural History). The Cretaceous Bryozoa (Polyzoa). Vol. III.—The Cribrimorphs, part 1, by W. D. Lang, 269 pages. The first two volumes of this series were issued in 1899 and 1909 respectively, and now Dr. Lang has taken advantage of 'certain general palæontological principles which have only of late become evident,' and by the aid of beautifully drawn plates he continues the Catalogue mainly on the lines laid down by Dr. Gregory. In his scholarly introduction, Dr. Lang refers to the history of the extensive collection of Cribrimorph material under his charge, and we notice that the national collection contains no examples from the Chalk of Yorkshire and Lincolnshire; polyzoa being rare in the Chalk of those counties. The softer chalk of Sussex, etc., has provided a wealth of material. It is gratifying to find that the Natural History Museum is continuing to publish its excellent catalogues, which are the admiration of the scientific world.

YORKSHIRE NATURALISTS AT DENT.

THE 292nd Meeting of the Yorkshire Naturalists' Union opened a Dent, for the investigation of Whernside, on May 14th. In spite of the difficulties of travel imposed by a severely curtailed train service, the President (Mr. H. B. Booth) and twenty members arrived at Dent station on the preceding Friday evening. With Mr. J. Hartshorn's characteristic foresight, motors awaited this party, and after a pleasant and picturesque drive of four miles, members were deposited at Headquarters, the 'George and Dragon' Hotel, Dent. Here several others had already assembled, and by means of private cars and other modes of travel the arrivals rapidly increased to thirty.

The natural beauties of Dent, and of the dale to which it gives its name, are too well known to require comment here. The district was visited by the Yorkshire Naturalists' Union in 1904, and a report of that meeting is to be found in *The Naturalist* for the same year.

Although Dent is the birthplace of Adam Sedgwick, one of the greatest geologists of last century, this fact did not serve to influence a gathering of geologists on the present occasion. Mr. H. E. Wroot was an exception, and his knowledge of the geology of the district proved valuable to members requiring information in this direction.

Evidence of the mineralogical character of the district was obtainable from the numerous 'rocks and stones' which adorned the window-sills of many of the cottages; these included good specimens of copper pyrites, witherite, and various forms of calcite and quartz. Interesting specimens of the richly fossiliferous Black Dent Marble were similarly plentiful, and a good example of its economic and decorative possibilities was to be seen in a fine mantelpiece in one of the more modern houses of the town.

On Saturday, under the guidance of Mr. Hartshorn, the party set out for the exploration of the northern shoulder of Whernside, working up Great Blake Ghyll, and as the detailed lists will reveal, the examination of this Ghyll yielded very profitable results. The weather forecasts of the several 'oldest inhabitants,' in the early morning of this day, had been variable, and soon after mid-day, by which time the shoulder had been reached, the opinion of the most pessimistic among the prophets became amply justified. The return journey was made by the shortest route, which proved to be a particularly wet 'moss,' and except for the squelch of water pressed out from the boot at every step, the descent was accomplished in silence. Even to the naturalist, Whernside appeared to offer little attraction in such a rain-storm as that experienced on this afternoon. The President and a youthful but enthusiastic ornithologist, who had penetrated as far as the Tarns, succeeded in getting lost in a fog from which they were extricated by the timely appearance of a keeper, who piloted them to Headquarters. A change of clothing, and dinner, restored the spirits of the members, who afterwards devoted the evening to a preliminary examination of their collections.

Following the usual custom, on Sunday, no special programme was arranged. In much more favourable weather, the President conducted a small and select party to one of the Yorkshire strongholds of the Peregrine Falcon, and a fatiguing journey was well repaid by the rare sight of the eyrie of a pair of these birds, the nest being found to contain two eggs, and two white, downy, infant peregrines. Another party visited the Holm Fell waterfall, while a third small contingent with mycological intentions, after working along the banks of the Dee, crossed the road and explored the woods on the hill side above Gate Garth. Other enthusiasts investigated the lichen and hepatic flora of Scotcher Ghyll. The results of these various activities are embodied in the more detailed notes to follow.

Monday proved another glorious day. The preliminary part of the

journey up Whernside, for the investigation of Greensett Craggs and Moss, lay through Deepdale to Gastack and was accomplished by motor. At the latter place the party was taken in charge by Mr. Cheetham, who, with a small number of other members, was camping at Ribbleshead. The view from the summit of Whernside was well worth the effort that had been required to gain it. From this point is spread out a panorama of Pennine grandeur which cannot be surpassed among Yorkshire scenery. The great slopes of Rise Hill, Widdale Fell, Ingleborough, Baugh Fell and Shunner Fell in the nearer distances, beyond which, tower fully forty miles away, the peaks of Helvellyn, Scawfell and other Cumberland mountains, all compose a cosmic picture which delighted those who beheld it. The natural history of Whernside proved so interesting in a general way that botanists turned from their plants to snatch a hurried glance through proffered field glasses, at a Raven on the wing; to examine a nest of young Golden Plovers, which, until pointed out by the President, would have been passed unnoticed by any but the most experienced observer, so closely did the birds resemble the mossy patch which formed their nest. A Black-backed Gull, hawking the moors in search of grouse eggs, a Curlew's nest, the nests of Snipe, Pipits and other birds, provided interest for all the members. On another occasion the zoologists left their birds and beasts and gave themselves up to a search for the rare Dwarf Willow, *Salix herbacea*, immediately the discovery of this plant became known.

Such experiences in the life of a naturalist are unforgettable; they act as an incentive to the more serious part of his work, as well as add to the enjoyment of doing it. On the present occasion the latter resolved itself into an ecological and cryptogamic survey by the botanists, while valuable additions to our knowledge of both the vertebrate and invertebrate fauna of the district were contributed by the zoologists.

The types of vegetation existing on Whernside are shown with great clearness on the east face. Here from 1,100—1,750 ft. the slope is covered with wet grassland ('Grass-moor') in which *Nardus*, *Juncus squarrosus* and *J. effusus* are most abundant. As in Reeth district (*The Naturalist*, 1920) this overlies the shales of the Yoredale series. Above this lie Greensett Craggs among *Festuca ovina* grassland (to 1,850 ft.), and Greensett Moss (1,950 ft.), degenerate peat covered with *Eriophorum vaginatum* and *Calluna*. The steep and broken slopes on this side of the summit ridge support a sub-alpine grassland in which *Salix herbacea*, *Carex rigida*, *Lycopodium Selago* and *L. alpinum* occur.

Although Greensett Craggs are formed of the same limestone and lie at nearly the same altitude as the parts of Ingleborough richest in alpine species, their flora is singularly poor, a fact probably due to their dryness, as the drainage from above runs off down Force Ghyll.

The feature of Whernside is, however, the extensive plateau lying north of the summit at about 2,100 ft. This shows in a striking way various stages in the denudation of *Eriophorum* peat, originally from 6 to 10 ft. deep. Patches of *Nardus* on redistributed peat are common, and just above the Tarns, large areas of bare rock detritus are now exposed, and on the eastward side of these areas wind and sand-blast are rapidly cutting away the peat. It is, apparently, only where the surface is no longer exposed to sand movement that any re-colonisation by plants can be attempted. In slight and moister depressions, however, a carpet of *Racomitrium lanuginosum* re-colonises the bare stones along with occasional plants of *R. canescens*, *Carex rigida*, *Agrostis canina*, *Festuca ovina*, *Nardus* and *Juncus squarrosus*. This carpet is in turn replaced by *Nardus* and finally by *Calluna*. Where a thin layer of peat has been washed on to the original stones, the grasses alone appear to be the colonising agents.

On the more exposed parts the only plant is stunted *Calluna* in wedge-shape masses about a foot in diameter and three inches high.

The stems (at the apex of the wedge) are imbedded in coarse sand or gravel, a few leaves occur on the more sheltered leeward side. The weathering of the grits and the resultant sand movements appear to prevent these areas from passing into extensive *Racomitrium* heaths such as are found in the Lake District and in Scotland at similar altitudes, but where the rocks are more durable.

FLOWERING PLANTS.—In addition to the plants common to the district the following species were observed :—

<i>Geranium sylvaticum</i>	<i>Allium vineale</i>
<i>Salix herbacea</i>	<i>Serratula tinctoria</i>
<i>S. repens</i>	<i>Carex rigida</i>
<i>S. repens</i> × <i>aurita</i>	<i>Convallaria majalis</i>
<i>Melica uniflora</i>	

FERNS.—No fewer than 17 species of ferns were noted, and among them, 10 are worthy of mention, viz.:—

<i>Asplenium Ruta-muraria</i>	<i>Lasraea montana</i>
<i>A. viride</i>	<i>L. Filix-mas</i> var. <i>Borreri</i>
<i>Phyllitis Scolopendrium</i>	<i>Polypodium Dryopteris</i>
<i>Cystopteris fragilis</i>	<i>P. Phegopteris</i>
<i>Polytichum aculeatum</i>	<i>Ophioglossum vulgatum</i>

MOSESSES.—Mr. Chris. A. Cheetham reports as follows :—The mosses of Great Blake Ghyll were well investigated and recorded by West in the article cited in the circular. The striking features here are masses of fruiting *Hypnum commutatum* Hedw. and *Weisia rupestris* C.M. on the limestones, fine *Breutelina arcuata* Schp. on the banks, *Zygodon mougeotii* B. and S., varying in colour from pale brown to black below, abundant further up the stream. In the water, *Fontinalis antipyretica* L. *Hypnum ochraceum* Turn. and *Hyocomium flagellare* B. and S. point to a soft type of water. Other interesting species in this locality are *Bartramia ithyphylla* Brid.; *Plagiobryum Zierii* Lindb., *Fissidens osmundoides* Hedw., *Weberia carnea* Schp. c. fr., *Mnium orthorrhynchum* B. and S., *Encalypta ciliata* Hoffm., *Trichostomum crispulum* var. *nigroviride* Braithw. and *T. tortuosum* var. *fragilifolium* Dixon.

On the moor above are *Polytrichum alpinum* L., *P. strictum* Banks, *Splachnum sphaericum* Linn. fil., and *Dicranodontium longirostre* var. *alpinum* Schp.; and on grit rocks near the springs at the head of the stream *Andreaea petrophila* Ehrh.

The mosses of the summit are few, but amongst them may be noted *Racomitrium heterostichum* var. *gracilescens* B. and S. The much coveted *Aulacomnium turgidum* Schwaeg. was not seen.

Greensett crags face too much south and are not backed by high ground to keep them wet, and proved uninteresting, no additional species being found there. A fine ghyll commences at their north end and runs down to Ribbleshead and Chapel-de-dale, known as Force Ghyll; this is a good place and the best find of the excursion came from here, masses of *Bartramia Halleriana* Hedw., 5 to 6 inches deep, and full of fruit; all the other mosses cited occur here, also *Swartzia montana* Lindb., *Blindia acuta* B. and S., *Pterygophyllum lucens* Brid., and a very wide-leaved form of *Catharinea undulata* W. and M. approaching *C. crispa* James.

LIVERWORTS.—Mr. F. E. Milsom devoted his attention to the hepatics of the district, and the following is his report :—

As was to be expected from its situation, Dent proved to possess a luxuriant hepatic flora, both on the open moorland and in the ghylls.

On the sides of the Whernside, *Leptoscyphus Taylori* was traced up as far as the 2,000 ft. line. *Scapania dentata*, with its handsome red tinge, was abundant at the sides of the streams, being especially prevalent near the summit, as was, of course, the common *S. undulata*.

The rare *S. uliginosa* was searched for unsuccessfully above 1,800 ft. A fine patch, a foot in diameter, of *Ptilidium ciliare* was noticed at about 1,900 ft. This more usually occurs as scattered stems among *Calluna*, etc. *Lophozia quinquedentata* was common all over the mountain slope.

Of the wooded ghylls at lower levels, Scotcher Ghyll may be taken as an example.

*Lejeunea*s were frequent, *Lejeunea lavifolia*, *Microlejeunea ulicina*, and also the rare *Cololejeunea Rossettiana* (found with perianths) being noted. *Metzgeria pubescens* was abundant on the rocks, as it also was on the damp walls.

Plentiful by the sides of the streams, both on the mountain, and in the ghylls, were large patches of *Blepharostoma trichophyllum*, one of the most beautiful of the foliose hepatics, especially when viewed microscopically.

The following is a list of the species noted :—

<i>Reboulia hemisphaerica</i>	<i>Chiloscyphus polyanitens</i>
<i>Conociphalum conicum</i>	<i>Cephalozia bicuspidata</i>
<i>Lunularia cruciata</i>	<i>Calyptogeia Trichomanis</i>
<i>Preissia quadrata</i>	<i>Lepidozia reptans</i>
<i>Marchantia polymorpha</i>	<i>Blepharostoma trichophyllum</i>
<i>Metzgeria furcata</i>	<i>Ptilidium ciliare</i>
<i>M. pubescens</i>	<i>Diplophyllum albicans</i>
<i>Ptilia epiphylla</i>	<i>Scapania aspera</i>
<i>Alicularia scalaris</i>	<i>S. nemorosa</i>
<i>Aplozia riparia</i>	<i>S. dentata</i>
<i>Gymnocolea inflata</i>	<i>S. undulata</i>
<i>Lophozia ventricosa</i>	<i>S. irrigua</i>
<i>L. quinquedentata</i>	<i>Radula complanata</i>
<i>L. Floerkii</i>	<i>Madothica platyphylla</i>
<i>L. attenuata</i>	<i>Cololejeunea Rossettiana</i>
<i>Plagiochila asplentoides</i>	<i>Lejeunea carifolia</i>
<i>Leptoscyphus Taylori</i>	<i>Microlejeunea ulicina</i>
<i>Lophocolia cuspidata</i>	<i>Frullania Tamarisci</i>
<i>L. heterophylla</i>	

To Mr. Milsom's list may be added *Plagiochila spinulosa*.

LICHENS.—Mr. W. E. L. Wattam, in reporting his observations, says there is no better testimony to the purity of the atmosphere of Dent than the lichen flora which gives the stone walls and the tree boles a picturesque appearance. A rough survey of the walls, built of mountain limestone and rocks of the Yoredale series, within a radius of one mile of the village, yielded the following species :—

<i>Xanthoria parietina</i>	<i>Lecanora parella</i>
<i>X. ulothrix</i> var. <i>viarella</i>	<i>L. dispersa</i>
<i>Pannaria rubiginosa</i>	<i>Acarospora fuscata</i>
<i>Parmelia conspersa</i>	<i>Cladonia pyxidata</i>
<i>Squammaria saxicola</i>	<i>C. fimbriata</i>
<i>Placodium sympageum</i>	<i>Lecidia lucida</i>
<i>Callopusia vitellinum</i>	<i>L. rivulosa</i>
<i>Lecanora atra</i>	<i>L. coarctata</i>
<i>Buellia canescens</i>	

Equally at home on the walls, and on the boles of Sycamore, Ash, Mountain Elm, Alder, Lime, and Oak, were the following species :—

<i>Platysma glaucum</i>	<i>Parmelia caperata</i> (not common)
<i>Evernia furfuracea</i>	<i>P. fuliginosa</i> var. <i>laetivirens</i>
<i>Parmelia perlata</i>	<i>P. physodes</i> and f. <i>labrosa</i>
<i>P. saxatilis</i> and f. <i>furfuracea</i>	
<i>Lecanora varia</i>	<i>Pertusaria communis</i>

In Scotcher Ghyll the following additional species were noted :—

Collema pulposum, on calcareous debris in the vicinity of the falls.

Baeomyces rufus, on sandstone boulders stream-side.

Cladonia macilenta, on rotten stumps.

C. gracilis var. *chordalis*, amongst heath vegetation at the head of the ghyll.

C. squamosa, amongst mosses.

Ramalina farinacea, on ash tree boles.

Usnea florida var. *hirta*, on boles of ash and mountain elm.

Pertusaria Wulfenii, on boles of ash.

Peltigera canina, on moss-covered rocks.

P. rufescens, and f. *praetextata*, on moss-covered rocks.

Lecanora Hageni, on an oak tree bole.

Graphis scripta, on boles of sycamore.

Lecidia parasema, on boles of ash.

At the head of the ghyll, amongst a dwarfed heath association of plants, occur *Cladina sylvatica* and *C. uncialis*.

Whernside, both through Blake Ghyll on the ascent of the northern shoulder, and also by way of Gable Rake on the Deepdale side, was instructive. The lichen flora of this Yorkshire mountain has, to a great extent, been recorded by the late Wm. West, and reference can be made to the pages of Lees' 'Flora of the West Riding.' The following species, however, do not appear previously to have been recorded for Whernside :—

Cladonia cervicornis, on the peat, rock ledges, top of Black Ghyll.

C. coccifera, on the peat, under Ling.

C. flabelliformis and var. *coronata*, amongst mosses, Blake Ghyll.

C. Floerkeana, on the peat.

Gyrophora polyrrhiza, on gritstone blocks, Deepdale side.

Cetraria aculeata f. *hispida*, amongst rock outcrops, Deepdale side.

Lecanora polytropha, on gritstone blocks, Deepdale side.

Rhizocarpon geographicum and var. *atrovirens*, do. do.

R. confervoides, do. do.

Lecidia lithophila, sandstone boulders, Blake Ghyll.

L. granulosa, on the peat.

L. uliginosa, do.

Noticeable was the abundance of *Cladina sylvatica* amongst the heath vegetation beyond the tarns, its luxuriant growth in places making it one of the most conspicuous features of the flora.

FUNGI.—One of the writers (F.A.M.) is responsible for the notes under this heading and for the list of fungi which is appended. The agarics were all common species, and with the exception of *Pluteus cervinus* and *Hypholoma fasciculare*, they were found on the lower slopes of Whernside, as well as in the immediate neighbourhood of Dent. An observation with regard to the vertical range of three of our commonest species may be recorded. Up to 1,500 ft. *Tubaria furfuracea*, *Stropharia semiglobata* and *Anellaria separata* all occurred frequently, but beyond that limit only *S. semiglobata* persisted, and specimens of this fungus were gathered at the summit of Whernside at 2,400 ft.

Nothing was seen of *Melampsora arctica* Rost. which occurs on *Salix herbacea*. This parasitic fungus has so far only been found in the British Isles on Ben-an-Doaih at an altitude of 3,100 ft., but where its host is plentiful the fungus is likely to be found, and future visitors to this station of *S. herbacea* will do well to bear in mind this possibility.

The luxuriant herbage at the foot of Great Blake Ghyll and on the banks of the Dee yielded all the Uredines. The Pyrenomyces, most of which have been identified by Sir Henry Hawley, were collected in the hedgerows near Dent.

A quantity of paste that had been thrown into a cottage midden was covered with a green mould which proved to be *Penicillium expansum*.

This species is common on apples, and it is the fungus usually mis-called *P. glaucum*.

A particularly interesting occurrence of an aquatic fungus attacking the water beetles *Agabus bipustulatus*, *A. guttatus* and *Hydroporus rivalis*, was brought to our notice by Messrs. Fordham and H. H. Wallis. This fungus appeared in the form of semi-transparent gelatinous specks, and occasionally as rather larger cushion-shaped pustules on the head, thorax, or elytra of several different specimens of the beetles collected from the pools on Whernside; the behaviour of the insects thus attacked was much more sluggish than that of normal specimens. Attempts have been made to isolate the fungus, but owing to the presence of enormous numbers of liquefying and other bacteria this has presented a good deal of difficulty. One beetle from which a growth of about 2 sq. mm. was removed was placed in an aquarium for further observation. After several weeks the insect shows no signs of any further development of the fungus, and it is more active now than when it came into our possession. It is possible, therefore, that the sluggishness observed was not a pathogenic symptom but was due merely to the insect being incommoded by the presence of the fungus growing on its exterior. So far, it may be said that the organism is one of the aquatic Phycomycetes, and that its parasitic nature appears doubtful. Both insect and fungus are still under observation.

Very useful assistance was rendered by Miss D. Hilary and Miss R. McIlroy in the collection of the following species:—

<i>Armillaria mellea</i> Fr.	<i>P. sphinctrinus</i> Fr.
<i>Omphalia fibula</i> (Bull.) Fr.	<i>Anellaria separata</i> (Linn.) Karst.
<i>Marasmius ramealis</i> (Bull.) Fr.	<i>Psathyrella gracilis</i> (Pers.) Fr.
<i>M. oreades</i> (Bolt.) Fr.	<i>Fomes annosus</i> Fr.
<i>Pluteus cervinus</i> (Schæff.) Fr.	<i>Polystictus versicolor</i> (Linn.) Fr.
<i>Tubaria furfuracea</i> (Pers.) W.G.Sm.	* <i>P. velutinus</i> (Pers.) Fr.
<i>Stropharia semiglobata</i> (Batsch) Fr.	<i>Stereum purpureum</i> (Pers.) Fr.
<i>Hypholoma fasciculare</i> (Huds.) Fr.	* <i>S. rugosum</i> (Pers.) Fr.
<i>Psilocybe foenicescens</i> (Pers.) Fr.	<i>S. hirsutum</i> (Willd.) Fr.
<i>Psathyra corrugis</i> (Pers.) Fr.	<i>Exidia glandulosa</i> (Bull.) Fr.
<i>Coprinus micaceus</i> (Bull.) Fr.	<i>Dacryomyces deliquescens</i> (Bull.)
<i>Panaeolus papilionaceus</i> (Bull.) Fr.	Duby.
	<i>D. stillatus</i> (Nees.) Fr.

**Uromyces flectens* Lagerh. on *Trifolium repens*

U. Alchemillae Lév. on *A. vulgaris*

U. Ficariae Lév. on *R. Ficaria*

U. Scillarum Wint. on *Scilla nutans*

U. Poae Raben. on *R. Ficaria*

Puccinia Centaureae D.C. on *C. nigra*

P. Hypochoeridis Oud. on *H. radicata*

P. Leontodontis Jacky on *L. autumnalis*

P. Chondrillae Corda on *Lactuca muralis*

P. variabilis Grev. on *Taraxacum officinale*

P. Hieracii Mart. on *H. Pilosella*

P. Betonicae D.C. on *Stachys Betonica*

P. tumida Grev. on *Conopodium denudatum*

P. fusca Wint. on *Anemone nemorosa*

P. obscura Schröt. on *Luzula campestris*

P. Caricis Reb. on *Urtica dioica*

**P. glumarum* Er. et Henn. f. sp. *Holcina* Eriks. on *Holcus lanatus*

Phragmidium Fragariastrum Schröt on *Potentilla Fragariastrum*

P. mucronatum Schlecht. on *Rosa canina*

Urocystis anemones (Pers.) Wint. on *R. repens*

* Indicates not previously recorded for N.W. Div. (V.C. 65).

Cystopus candidus Lév. on cultivated *Arabis*

**Plasmopora nivea* Schröt. on *Aegopodium Podagraria*

Peronospora Schleideni Unger. on *Allium ursinum*

**P. Violae* deBary on *Viola Riviniana*

**P. alta* Fckl. on *Plantago lanceolata*

Nectria cinnabarina (Tode) Fr.

Leptospora ovina (Pers.) Fckl.

**Melanconis stilbostoma* Tul.

Psilosphaeria spermoides Cke.

**Wallrothiella minima* (Fckl.) Sacc.

**Diatype bullata* (Hoffm.) Fr.

Hypoxyton fuscum (Pers.) Fr.

Xylaria hypoxyton (Linn.) Grev.

Phyllachora graminis (Pers.) Fckl.

P. junci (Fr.) Fckl.

Rhopographus Pteridis (Sow. (Wint.

Mitrophora semilibera Lév.

Ciliaria scutellata (Linn.) Quel.

Coprobria granulata (Bull.) Fr.

**Penicillium expansum* (Link.) Thom.

Chlorosplenium aeruginosum
(Oeder.) De Not.

Dasyscypha virginea (Batsch) Fckl.

Hyaloscypha hyalina (Pers.) Boud.

Mollisia cinerea (Batsch) Karst.

Trochila laurocerasi (Desm.) Fr.

Stegia ilicis Fr.

Rhytisma acerinum (Pers.) Fr.

**Septoria Hederæ* Desm.

**Phoma conigenum* Karst.

P. samararum (Desm.) Sacc.

Oidium moniloides Link.

**O. alphetoides* Griff. & Maubl.

Botrytis vulgaris Fr.

VERTEBRATE ZOOLOGY.—The President (Mr. H. B. Booth) reports that the ornithologists had a good time. Several species which occur commonly in the neighbouring dales were often rare or even absent. For instance, the Wheatear, Ring Ouzel and Snipe were very sparsely distributed, although many miles of apparently suitable ground were traversed.

On Whernside a few Dunlins were seen, and the Curlew and Golden Plover were fairly common; young of both species, and one Snipe's nest with young were noted. A nest of Golden Plover, in which the four nestlings had not left the nest came in for a great deal of admiration and comment. An addition was made to the list of breeding stations of the Black-headed Gull in Yorkshire, as published in *The Naturalist* for May, viz., on a pond on Greensett Moss, Whernside. I estimated that there would be about 80 pairs present, and about 50 nests already. Many of the latter were being built, or contained one or two eggs; while a few nests had three eggs in. The gamekeeper afterwards informed me that they had been there for about seven years to his own knowledge, and that they had been increasing in numbers since he first saw them. He also stated that ten or twelve pairs nested on a pond near his house at Gearstones, about $2\frac{1}{2}$ miles away from the Greensett gully.

In the valley Whinchats were numerous, and Redstarts, Common Whitethroats and Garden Warblers were fairly common. The Wood Warbler was heard in two different places, and the Corncrake was doing 'his bit.' The Pied, Yellow and Grey Wagtails were sparsely distributed, and the entire Bunting family was absent. In the *Corvidæ*, Magpies were common, an occasional Raven was seen crossing well overhead, and there was a fair-sized rookery in the grounds of Gate House. Carrion Crows and Jackdaws, however, appeared to be much less common than in the adjoining dales. On Sunday (May 14th) the ornithologists visited an eyrie of the Peregrine Falcon which for several years has been under the protection of the Yorkshire Naturalists' Union Wild Birds and Eggs Protection Acts Committee. From an adjoining cliff they had an excellent view, and found two young chicks, in the white down, had just hatched, and one of the two remaining eggs was 'chipped.'

The only other bird of prey noticed was the Sparrow Hawk:

A dead Common Shrew was picked up at the bottom of Great Blake Ghyll (about 900 ft.), and on each side of Whernside molehills ascended to about 1,700 feet. At this elevation they became smaller and much

fewer, and above that ceased. The Common Frog was noticed to be much more numerous on the upper drier reaches of Whernside than it was on the wetter slopes lower down; in fact, one was found within thirty yards of the highest cairn. Evidently after spawning these amphibians had made for the higher and drier ground. Trout, in the river, was the only species of fish noted.

MOLLUSCA.—The following Mollusca were collected by Mr. Greevz Fysher and verified by Mr. John W. Taylor :—*Arion ater* v. *melanocephala*, *Helicigona arbustorum*, *Hygromia rufescens*, *H. hispida*, *Helix nemoralis* v. *libellula* (12345), *Vitrina pellucida*, *Hyalina cellaria*, *H. alliaria*, *H. nitidula*, *Pyramidula rotundata*, *Zua lubrica*, *Clausilia bidentata*. One example of *Ancylus fluviatilis* was observed in a small stream running into the River Dee.

DIPTERA.—Mr. Chris. A. Cheetham's observations are as follows :—The weather was unfavourable for Diptera, but in Great Blake Ghyll fungus gnats and small limnobiids were plentiful and some interesting species were taken. Mr. F. W. Edwards kindly identified these, and states that one species, *Excychia confinis* Winn. is new to the country. *Ormosia* (*Rhypholophus*) *aciculata* Edw. was in plenty, this is the insect recorded as *R. nodulosus* Mcq. in *The Naturalist*, 1921, p. 254.† Two Boletinas were taken, *B. trivittata* Mg. being an addition to our list, and *B. inermis* Lunst. *Phronia forcipula* Winn. and *Allodia longicornis* are also additions the latter I have had previously from Farnley and Austwick. *Erioptera fuscipennis* Mg. (also from Beverley, Gormire, Austwick and Farnley) is unrecorded for the county. *Amalopsis immaculata* Mq. and *Dicranomyia chorea* Mg. complete the Great Blake Ghyll captures.

On the summit of Whernside the species were mostly very common low-land types, but two Empids, *E. lucida* Ztt. and *E. snowdoniana* Collin, are the species generally found in abundance on Cloudberry blooms.

COLEOPTERA.—Mr. W. J. Fordham reports :—Mr. H. H. Wallis and the writer investigated the beetle fauna of Great Blake Ghyll and the adjoining portion of Whernside on the Saturday. The following day was devoted to the immediate neighbourhood of Dent, and was restricted to the valley of the river, with a short ramble up Flintersgill. A total number of 98 species (not including varieties) was obtained. There were no new county records as far as the species are at present determined. Help was rendered by several other members of the Union, as noted in the following remarks on the more noteworthy species :—

**Notiophilus substriatus* Wat. An interesting black form of this insect was taken, with apices of the elytra of an orange hue.

Bembidium atroviolaceum Daf. (*stomoides* Dj.). Two examples under stones by the river in Dent dale.

B. decorum Pz. Also occurred here.

B. atrocoeruleum Steph. Under stones by the stream in Great Blake Ghyll.

Patrobus excavatus Pk. Occurred at about 1,200 ft. on Whernside. The montane *assimilis* Chd. was not seen, though it occurs freely on Ingleborough.

Pterostichus vitreus Dj. Whernside, about 1,800 ft. (one).

**Metabletus foveatus* Geoff. Great Blake Ghyll.

Hydroporus rivalis Gyll. Was taken in the stream at the head of Great Blake Ghyll.

H. borealis Gyll. (*davisi* Curt.). Abundant in the river in Dent dale, and easily captured by hand as it swims among the stones at the edge of the river.

† This and others will be described by Mr. Edwards in a future part of the *Transactions of the Entomological Society*. I have a number of additions to the Yorkshire list awaiting this publication.

- Hydroporus tristis* Pk. } In peaty pools on Whern-
H. picens Steph. (*gyllenhali* Sch.) } side, about 1,800 ft.
H. melanocephalus Gyll. (*morio*. Brit. Cat.) } *Hydrobius fuscipes* L.
H. nigrita F. } was very abundant in
 **Agabus sturmi* Gyll. } these pools.
A. guttatus Pk. occurred in a slowly running peaty channel, and one specimen was taken suffering from a fungus disease (together with two or three—
A. bipustulatus L., a species of *Hydroporus* similarly affected). These were given to Mr. Mason for investigation.
 **Sphaeridium bipustulatum* F. } Occurred in sheepdung on the moors,
 **Tachinus laticollis* Gr. } together with several species of
Deliphrium Pk. } *Staphylinidae* and *Aphodii*.
Staphylinus erythropterus L. One under stone in Flintersgill.
Astilbus canaliculatus F. With ants in Great Blake Ghyll (Mr. J. Beanland).

Dr. Rowe reported that on the hillside down Dent dale he found a species of *Geotrupes* on a frog! Probably an accidental occurrence.

Haltica ericeti Al. (?). An example of what is probably this species was taken on the side of Whernside by Mr. Mason.

**Galerucella tenella* L. On meadowsweet, Dent dale.

Barynotus moerens F. } Dent dale, by sweeping.
B. schonherri Zett. }

**Meloe violaceus* Marsh. One in Great Blake Ghyll, about 1,200 ft. (Dr. Rowe).

The asterisk (*) denotes new vice county records, and in addition, there were found five common species, which have apparently not previously been placed on record for V.C. 65.

PEAT INVESTIGATION.—One of us (W.H.P.) made the following observations:—Owing to the vigorous denudation of the peat on Whernside, numerous sections are exposed, and the distribution of buried timber can be followed in some detail. Birch wood occurs below the peat of Greensett Moss (1,950 ft.). In this place the logs remaining are small and occur in scattered patches. As the buried timber is absent in the peat above at 2,000 ft., this would seem to be the former tree limit. On the Northern slopes, birch in the peat is frequent to 1,800 ft. at least, and there must have been a nearly continuous birch wood between Great Blake Ghyll and Greensett Moss. Pine and Hawthorn also occur rarely, and an unidentified tree is more frequent. Buried Birch wood exists on White Shaw Moss (1,500 ft.) on the west of Whernside.

In all cases observed, the timber is just above the basal clay with from 3 to 10 ft. of the *Eriophorum* peat above it. On one place, Birch mixed with *Calluna* and *Eriophorum* formed a basal bed two feet thick. In several places *Calluna* was present immediately above the Birch layer. In no case was any marked stratification of the upper cotton grass peat noticed.

The proceedings terminated, on May 16th, with a Meeting at Headquarters under the Chairmanship of the President. Five new Members were elected and the affiliation of the Berry Brow Naturalists' Society was confirmed. Brief reports on the work of the various sections were given by members already named in this report, with the addition of observations on the geology of the district, and some reminiscences of Adam Sedgwick, by Mr. H. E. Wroot. Votes of thanks were accorded to Lord Bentinck and Mr. Burra, Esq., for their kindness in granting permission to visit their respective estates, and to Mr. Hartshorn for the local arrangements which had proved so satisfactory. Mr. Hartshorn read a congratulatory communication from our veteran member, William Horne, of Leyburn, which was appreciated and duly acknowledged.

W. H. PEARSALL.

F. A. MASON.

FIELD NOTES.

BIRDS.

Kestrel's Nest built in a Barn.—Dr. Marquis' son has brought me a young Kestrel to-day which has evidently been reared in a nest in a barn.—E. P. BUTTERFIELD.

Interesting Birds at Melmerby, Cumberland.—On the 6th of May a male Pied Flycatcher was observed in this parish. It has been previously recorded for this neighbourhood (*e.g.*, at Edenhall, etc.). On June 17th, a nest of the Great Spotted Woodpecker was found in Birknab Wood, Melmerby. The young birds were almost ready to fly. It is unusual for this species to nest in this county.—Rev. W. W. MASON, Melmerby Rectory, Carlisle.

Spotted Crake near Keighley.—I have a Spotted Crake which I got from Mr. Pilling, which had been met with in the spring near Keighley. This is a much scarcer breeding species than the Water Rail, and although the nest has never been found in this district, it is presumed that it may occasionally breed, as may be inferred from the season when the above bird fell into the hands of Pilling. This species has been found breeding near York and near Ackworth.—E. P. BUTTERFIELD, Wilsden.

Skylark removing its young.—A Skylark's nest, recently discovered in the Scarborough Cemetery, contained four young ones. A day or two later the grass was cut, exposing the nest. Shortly afterwards the nest contained only a single young one, and it was suspected that rats had taken the others. Watch was kept, and the parent bird was seen to return to the nest, grasp the remaining nestling firmly in its feet, and fly away with it to a place of security.—W. J. CLARKE, F.Z.S., Scarborough.

Young Thrushes fostered by a Robin.—At Castleton, Yorks., on June 19th, I watched four young Thrushes being fed by a Robin. They were fully fledged and almost twice as big as their foster mother. No doubt their parents had been killed by a cat and the robin had taken pity on them. She may have lost her young ones about the same time. She was kept very busy supplying the youngsters with food, and it was most amusing to watch them rush for her as she arrived with bits of bread.—H. A. BOOTH, Danby.

Fulmar Petrels at Scarborough.—For some time I have been receiving reports of strange seabirds in both North and South Bays at Scarborough, and eventually I was told that similar birds had been about the Castle Cliff. On June 23rd, I went down to the Marine Drive and had not been there very long before I saw three Fulmars come in from the

sea and fly into the cliff. They did not alight, but flew along the side of the rock at an altitude of about 150 feet, and very close to the cliff side, prying into all the little hollows and crevices. After a time the three birds departed together over the sea. Between 3 p.m. and 9 p.m. I saw a constant procession of single birds, possibly the same individuals over and over again, visiting the cliff, where they paid brief visits of inspection and then departed. On several occasions they alighted on the small patches of rough, grassy earth, about two thirds way up the cliff, and once or twice on the rock ledges, where the resident Jackdaws resented their intrusion. They seemed very clumsy at getting a footing, and made many attempts, frequently falling back into the air before achieving their object. On the following afternoon I went down again and saw the same thing, on one occasion five birds being in the cliff at one time. I have heard of a flock of 25 of these birds being seen recently in the North Bay at a distance of a mile from the shore, and numerous smaller parties have been reported, which appear from the description given; to be of this species.—W. J. CLARKE, F.Z.S., Scarborough.

Birds in Duncombe Park, Helmsley.—In company with Mr. F. H. Edmondson I spent the first week-end in June at Helmsley, where we had the advantage of the company of Mr. A. Gordon, the head gamekeeper, who is a good field ornithologist; his knowledge extending to the smaller species—just where most game-keepers fail. It was a great treat to me again to see the Lesser Spotted Woodpecker, although it was no easy matter, as it practically confined itself to the upper dead branches of the larger trees. No doubt one bird was incubating, and the other bird quieter, as I never saw two birds at the same time, or heard it call or ‘rap,’ during the few hours in all (at different times) that I watched for it. Mr. Gordon said that there were at the least two pairs of that local Yorkshire bird, the Nuthatch. We watched one pair for some time, that was very busy feeding young in a hole in a tall Beech. The Pied Flycatcher was a fairly common bird all along the river side in the park; a pair being stationed every few hundred yards along its banks. By their disused nesting holes we saw plenty of evidence of the larger Woodpecker, but did not actually see the birds. Mr. Gordon informed us that both the Green Woodpecker and the Greater Spotted Woodpecker occurred and were not uncommon. Jackdaws were abundant, and several pairs were nesting like Rooks in the upper forks and branches of trees; but without the assistance of being in a rookery, as I have usually noticed such nests before.—H. B. BOOTH, Ben Rhydding.

Water Rail Breeding near Wilsden.—During the later part of last April, two young men informed me that they

had found the nest, with eggs, of a Moorhen besides a sheet of water in this neighbourhood, but on shewing me the eggs last week, they proved to be eggs of the much rarer bird, the Water Rail. It is certainly a scarce breeding species in nearly, if not in all parts of Yorkshire, perhaps in some districts more so than formerly. It is said to have bred formerly in the valley between Thornton and Bradford, but not within recent years. I have no record of its having bred in any other part of Airedale, although it has bred in Wharfedale, Ribblesdale and Nidderdale very sparingly. It is more commonly met with as a winter visitant. I have seen it at Cottingley Bridge, and have a stuffed specimen which I received from the late Mr. Pilling, which had been got in the neighbourhood of Harden or Bingley.—E. P. BUTTERFIELD.

Two Eggs of Cuckoo in Nest of Linnet.—Cuckoos have been abundant here this summer. Few however, were seen before the last week in May or the first week in June, when they were everywhere in the woods where there was any quantity of oak trees; the leaves at this time were infested by myriads of larvæ, of various species of moths, chiefly *H. defoliaria* on which they were feeding and of which they are fond. The caterpillars also attracted large numbers of Starlings and other birds, but in spite of the united efforts of all the birds, the trees, soon after the middle of June, were almost as bare as in winter. The Cuckoos here gave up calling on or about June 20th, since which date very few have been seen. Two eggs of the Cuckoo have been found in the nest of a Linnet with three eggs this season, on Blackhills, which is the first instance of the Linnet having been victimised in this district, and another Cuckoo's egg has been found in the nest of a Hedge Sparrow, which is a very rare occurrence here. The two eggs found in the nest of the Linnet were very similar, but there was a slight variation, and they might have been laid by different cuckoos. Two eggs brought to me by two young men from a nest which I take to be Skylark, built in a meadow near Barden Tower about a fortnight ago, I take to be those of a Cuckoo, if so, they have been laid by one Cuckoo.—E. P. BUTTERFIELD.

This year, quite near my house, I found a Hedge Sparrow's nest in a gorse bush, containing a newly-hatched Cuckoo, and on the edge of the nest two dead young Hedge Sparrows and one egg. Visiting it again about 10 days later, I found the nest deserted and the young Cuckoo dead in the nest; apparently it was about a week old.—R.F.

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ENTOMOLOGY.

Vanessa polychloros at Newsome.—A fine specimen of this locally uncommon butterfly was in my garden on the 2nd July.—W. E. L. WATTAM.

Thecla rubi in Yorks.—A boy brought me a butterfly which he had taken on Baildon Moor last May, and it proves to be the Green Hairstreak, *Thecla rubi*. My brother and I took one specimen on Barden Moor in the early eighties of the last century, and in later years we turned it up abundantly in the same locality, so perhaps it is extending its range.—E. P. BUTTERFIELD.

Bryophila perla in Notts.—I was pleased to observe a freshly emerged ♂ of this species in its usual environment this afternoon—viz, the inside window of my upstairs study! Every year, for about fifteen years, I have had the pleasure of seeing this delicate moth, on making its annual call and seeing it safely off the premises.—ALBERT ERNEST HALL, Cranfield House, Southwell, Notts., July 6th, 1921.

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BOTANY.

Sambricus Ebulus in Yorks.—On the occasion of a recent meeting of the Mexborough Secondary School Scientific Society, *Sambricus Ebulus* L. was observed in what appears to be a new station. The plant was growing in abundance on the embankment at the north-western end of the Dearne Valley Railway Viaduct over the Don, below Conisborough. It is well established, forming two extensive thickets. It doubtless owes its introduction here to the construction of the railway. On this same occasion (June 16th) an enthusiastic botanist, Miss Ivy McGrath, discovered *Astragalus glycyphyllos* L. in some amount on the embankment (G. C. R.) west of the Conisborough Tunnel.—A. A. DALLMAN.

Hypnum crista-castrensis L. near Selkirk.—The note in *The Naturalist* for May, by Mr. Jas. Murray, induced me to write, and Mr. Murray kindly sent me a specimen. It was certainly due to having a specimen that I was able so quickly to find it in this district. As far as the writer is aware this is a new record for Selkirkshire. The moss was found in a mixed wood near Bowhill House, about 4 miles from Selkirk. Conifers are well represented, but a variety of deciduous trees predominated, and where the moss was found very few pines were around. It was first found beside a century old Scotch fir, but was more abundant a short distance away under a young silver birch. It was growing

mixed with *Polytrichum formosum*, *Dicranum scoparium*, *Thuidium tamariscinum*, and *Hylocomium triquetrum*.—J. R. SIMPSON, Marion Crescent, Selkirk.

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MAMMALS.

Early record of the Marten in Yorkshire.—Bingley in his *Memoirs of British Quadrupeds*, published in 1809, p. 189, writes :—‘The Martin (*sic*) produces young ones more than once in a year ; generally in the spring and autumn. The younger females do not bring more than 3 or 4, whilst those of more advanced age have 6 or 7 at a litter. The female makes her nest in the hole of a decayed tree or wall, in the cleft of a rock, and sometimes in a deserted rabbit burrow. A Martin which had been shot on the moors above Holmfirth in Yorkshire, having escaped into its retreat in the ground, was dug out, and at the further end of the burrow there were found as many feathers, feet and bones of grouse and other birds as would have filled a couple of Winchester bushels. . . . This animal is not uncommon in many of the southern parts of Great Britain and Ireland. Its usual habitation is a lodge formed in the hollow of some decayed tree in a wood ; but in mountainous countries it resides only amongst rocks. Hence in most parts of Wales it has the name of Bela graig, or Rock Martin.’—H. E. FORREST.

Polecats in Shropshire and North Wales.—On 2nd April, 1921, a fine male Polecat was trapped on Clunbury Hill in South-west Shropshire, where another had been caught about mid-March, 1917. In the neighbouring county of Montgomery a large one, weighing 3½ lbs., was killed by a sheep-dog, after a fierce tussle, in October, 1920. In that same year, no fewer than nine were trapped on the Llandinam Estate of Major David Davies, M.P. I am indebted to Miss Frances Pitt for this last record, and she also tells me that another example of the curious erythristic variety (which I described in *The Zoologist*, 1904) was obtained at Crosswood, Aberystwyth, in November, 1919. A Polecat was recently sent in to a Shrewsbury taxidermist from Llanllugan, near Newtown, Montgomery, where the tracks of one had been seen in the snow, January 3rd, 1918. It appears from these recent records that the Polecat is holding its own fairly well in Montgomeryshire and the neighbouring parts of Shropshire, and is less rare than is commonly supposed. About ten years ago I saw a number of Polecats—three in the flesh—in the shop of Mr. Jeffreys, taxidermist, Caermarthen, who told me, in reply to my enquiry, that he had between 30 and 50 every year for preservation ! From other sources, too, I learnt that the Polecat is still fairly common thereabouts. Next

to that I should think it is most numerous about Aberystwyth, where Mr. Hutchings has several every year to preserve. This is the only district from which the erythristic variety has been obtained; the strain is remarkably persistent, animals with the red colouration having been obtained here for many years past.—H. E. FORREST, Shrewsbury.

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Coal and What We Get From It, by **Raphael Meldola**, S.P.C.K. 210 pp., 4/6 net. This veritable 'Romance of Applied Science,' by our old friend Prof. Meldola, is doubtless well known to our readers. We here merely record that the little volume has now reached its seventh thousand, which is some indication of its popularity. At the price named a well printed and well bound volume is not dear, and when the text has been written by an authority of the standing of Prof. Meldola, the volume is cheap indeed.

The British Museum (Natural History) has issued a **Handbook of Instructions for Collectors**. 222 pp., 5/-; and seeing that this has reached the fourth edition, it speaks for the popularity of this excellent little work, which is the result of the experience of specialists in the different branches of Natural History dealt with. Not only are Mammals, Birds, and other larger animals referred to, but even Sponges, Spiders, Flies, Marine organisms, and various kinds of Plants, Fossils and Minerals are dealt with.

A Text-book of Oceanography, by **Dr. J. T. Jenkins**. Constable & Co.: 206 pp., 15/-. The impetus given to the study of Oceanography by Professor Herdman in his recent presidential address to the British Association will doubtless have much effect in furthering the study of this fascinating science, and now that Dr. Jenkins' book has appeared, it enables those interested to get a little more information of a practical nature than is possible from Dr. Herdman's address. This book is very well illustrated, and can thoroughly be recommended to students.

The Tin Resources of the British Empire, by **N. M. Penzer**. London: W. Rider & Son, 358 pages, 15/-. In this volume the author deals in great detail with the Tin Resources of the World, including localities as far distant as Hong Kong, Rhodesia and Tasmania, and by the aid of various plans, diagrams and statistics, gives a comprehensive survey of the Tin producing areas. So far as the British Isles are concerned, the Tin Mines are confined to Cornwall and Devon, and as showing the rate at which the value of the metal has increased in recent times, in 1914, 581 tons realised £53,000, whereas the same quantity in 1918 realised £113,000. There is a chapter on Industrial Applications of Tin, Prices, and the world's output, an extensive bibliography, and a good index.

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L. Dudley Stamp has a lengthy paper 'On the Beds at the Base of the Ypresian (London Clay) in the Anglo-Franco-Belgian Basin, in *The Proceedings of the Geologists' Association*, Vol. XXXII., part 2. issued May 9th.

Among the contents of the 'Annual Report and Proceedings of the Bristol Naturalists' Society,' recently issued, we notice 'Camouflage in the Insect World,' by G. C. Griffiths; 'The Life of a Diatom,' by C. Bucknall, and 'The Pleistocene Formations of Claverham,' by E. Greenly.

We learn from the *Daily Mail*, a few days ago, that the 'experiment at the Sunderland Museum where blind children are taught to "see" the exhibits by touching them with their hands,' which was described at the Hull Conference of the Museums Association in 1913, is still 'in progress,' and if the animal there figured, which we presume by the tusks, is a walrus, it seems not altogether an affliction that the children are blind.

NORTHERN NEWS.

E. Heron-Allen writes on 'Intelligence in the Protozoa,' in *Nature*, June 9th.

Professor Walter Garstang has been elected a fellow of the Linnean Society of London.

The University of Durham has conferred the honorary degree of D.Sc. upon Prof. A. Meek.

The death is announced of Frederick T. Maidwell, F.G.S. He was born at Gunnerside, in Swaledale, in 1872.

According to *The Geographical Teacher*, No. 60, p. 19, the Geographers are to have a 'Summer Shoo' at Guernsey, which sounds cooling anyway.

Mr. Horace Donisthorpe writes on '*Nabis lativentris* Boh., a myrmecophilous insect,' in *The Entomologist's Monthly Magazine* for June.

At the Annual Conference of the Museums Association held at Paris in July, Mr. T. Sheppard, M.Sc., was elected by the Council as President for 1922-23.

Dr. J. W. H. Harrison has a paper on 'The Inheritance of Size in the Crosses involving *Oporabia autumnata* and *O. filigrammaria*,' in *The Vasculum* for May.

We notice *The Entomologist* refers to the Entomological Society: possibly this has to do with the 'tomoloos' Flint Jack used to profess to examine for antiquities.

Dr. Roger Verity has an essay on 'The Systematic Study of Variation in the Races of *Zygaena filipendulae* L. and of its subspecies *stoechadis* Bukh.,' in *The Entomologist's Record* for May.

N. F. Ticehurst writes on 'Former Breeding-places of the Oyster-catcher and Black-headed Gull in East Sussex'; and Stanley Crook writes on 'The Rook,' in *British Birds* for June.

Mr. R. S. Frampton, 37 Fonthill Rd., Finsbury Park, N. 4., has issued a classified Catalogue of second hand books devoted to various branches of history. The prices are remarkably low.

A portrait and memoir of the late John Ray Hardy, and a valuable series of new records for the area, relating to various branches of natural history appear in *The Lancashire and Cheshire Naturalist* for May.

Among the species figured in Part XXVII. of Buckman's *Type Ammonites* we notice *A. erugatus* (*Psiloceras erugatum*), from Robin Hood's Bay; *A. oculatus* (*Neumayriceras oculatum*), from Scarborough.

We observe that the formerly well-known list of 'Geological Literature added to the Geological Society's Library' for the year 1913, made its appearance in June or July, 1921. We will not make any comments.

W. G. Sheldon has notes on '*Oxigrapta literana* L.: its life-cycle, distribution, and variation'; and H. Rowland-Brown describes *Colias edusa* Fab.: its seasonal forms, varieties and aberrations,' in *The Entomologist* for June.

A correspondent writes:—'In reference to the excerpt (p. 229) from Chapel Cuckoo's works, is the Editor aware that about this time of the year a Canary much resembles Grass, in that the Cat'll eat it?' The answer is in the affirmative.

Dr. Hugh R. Mill writes on 'The Value of Regional Geography'; W. S. Lewis on 'The Evolution of the South-west' [Devon and Cornwall]; and Grace E. Hutchinson on 'Population and Parishes in the Ravensbourne and Darent Basins' in *The Geographical Teacher*, No. 60.

The entomological collections formed by the late J. W. Carter have been purchased by the Bradford Corporation for the Cartwright Memorial Hall, which is the proper home for the collection. Not only does this series represent many valuable Yorkshire examples of lepidoptera, but there are dragon-flies, beetles, bees, wasps, etc. The herbarium of British Plants formed by the late Dr. Willis has also been added to the Museum, having been given by the doctor's daughter.

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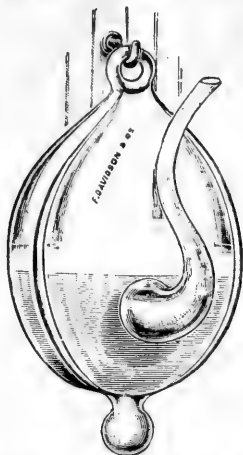
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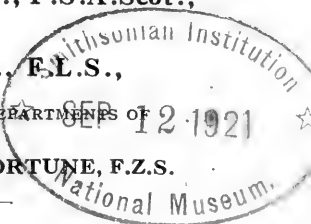
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A FIELD EXCURSION to Roundhay and Adel will be held on Saturday, September 17th, to investigate the Autumn Cynipidæ of the Oak, as well as any incidental Galls.

Meeting Place.—Morning: Canal Gardens, Roundhay Park, at 10 a.m. (Refreshments obtainable locally.) Afternoon: Moortown end of Street Lane, 2-30 p.m., for Adel. (Refreshments obtainable locally.)

All interested are cordially invited.

W. P. WINTER, *Convener*, Hurst Wood Road, Shipley.

MEMBERS who have not paid their subscriptions, due January 1st, are requested to do so *immediately*. This will not only save the time of the Hon. Treasurer, but save the heavy cost of printing and posting reminders. Members are reminded that the minimum subscription is now 15s., those who have only paid 12s. 6d., are requested to remit the balance.

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NOTES AND COMMENTS.

MUSEUMS IN THE PRESENT AND FUTURE.

'The intelligent world has of late been passing through one of its cyclical phases. It would hardly be suspected that in these times the daily tale of news from home and abroad should be so wanting in human interest that it was necessary to seek for recondite subjects. Nevertheless, astute editors or others on the staff of our daily newspapers have been constrained to discover that all is not well in our artistic atmosphere, and they call attention to the sad need of refinement in our surroundings, that our street architecture, though showing signs of grace, lacks coherence and taste, that our statues are deplorable, our public monuments wanting in dignity or design, and that, in fine, the necessity for organisation and method is called for as much for our spiritual betterment as it is on the material side. A number of distinguished men, architects, painters, and critics of both, and of all else, have come forward, and their plans for a new and glorified earth have been placed before a grateful world.'

SIR HERCULES READ'S ADDRESS.

The preceding paragraph is extracted from the Presidential address of Sir Hercules Read to the Society of Antiquaries, which appears in No. 3 of that really admirable publication, *The Antiquaries Journal*. As Sir Hercules has now retired from his position at the British Museum, he is able to speak more freely, and he does so. He has much to say about the management of the British Museum and other national Museums. He criticises the Victoria and Albert Museum and other Museums in London, points out the way in which they overlap each other, and makes a strong appeal for the separation of the department of books from the present British Museum building, and for the formation of a National Library, before all the available central sites are utilised. He points out that ere long every available space in the Bloomsbury building will be required for Museum purposes, and he suggests that a separation of the departments of books from the building will do away with what he considers to be an anomaly in having the Principal Librarian the governing officer of the British Museum. The address is well worthy of careful consideration, though we must admit that if Sir Hercules had been the Director of either the Irish, Welsh or Scottish Museums, or of one of the large provincial Museums, his opinions might have been modified or differently expressed.

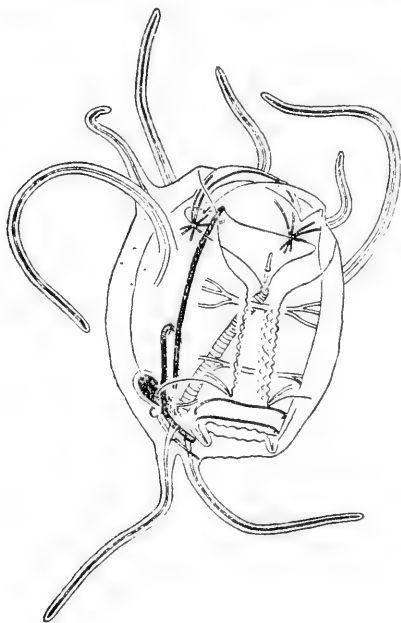
BRITISH MAMMALS.

We are delighted to find that after a lapse of five years 'A History of British Mammals,' by Gerald E. H. Barrett-Hamilton and Martin A. C. Hinton, has reappeared, and

part 20 has now been published by Messrs. Gurney & Jackson, at 3/6. It deals with the House Mouse, the St. Kilda House Mouse, Beaver and the Squirrel.

TRAUSTEDTIA MULTITENTACULATA.

We must admit that at first we considered the illustration of the animal reproduced herewith to be a caricature of a Japanese soldier on the war-path, such as one sees on the Japanese shields, etc. Actually, however, it is a solitary form of *Traustedia multitentaculata*, which is described by



Dr. Asajiro Oka in the first part of Vol. X. of *Annotationes Zoologicae Japonenses*, recently issued by the Tokio Zoological Society. We are glad to observe that this very valuable publication, much of which is printed in English, still appears regularly.

EARTHQUAKES.

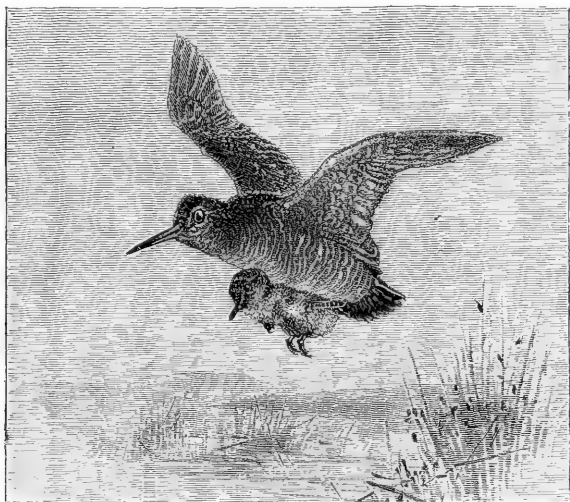
A Manual of Seismology* has appeared from the pen of Dr. Charles Davison, whose numerous papers on earthquake phenomena, which have appeared in various scientific journals, are well known, and whose book on the 'Study of Recent Earthquakes,' is a remarkable compilation. In the present

* Cambridge University Press, 256 pp. 21/- net.

work the author deals with various aspects of seismological science, from the instruments used to the origin of tectonic earthquakes. While the study of earthquakes was formerly largely in the domain of the geologist, recent researches certainly seem to show that the subject is more for the mathematician and physicist. By the aid of a hundred well chosen illustrations—maps, diagrams and photographs,—the various chapters on the numerous aspects of seismology are made even more interesting.

BIRDS AS PARENTS.

Prof. J. Arthur Thomson has an entertaining story, with



How the Woodcock carries its young ones.

(From the Badminton Library.)

the above heading, in *The Strand Magazine* for July, in which he describes various nesting and other habits of birds and the way in which they look after their young. He tells us 'a transport of nestlings to a place of safety has been occasionally recorded, as in the eagle-owl, and it is not very uncommon in the woodcock. How the woodcock carries its young has been discussed; it is probably correct to say that they are pressed between the thighs, and that the long bill may also be used to steady them.' The article is illustrated by a number of illustrations, one of which we are kindly permitted to reproduce. We don't know, however, whether Prof. Thomson knew the publication would be headed in large letters 'Grand Summer Fiction Number!'

CHARLES LAPWORTH.

As a special supplement to Vol. XIV of the *Proceedings of the Birmingham Natural History and Philosophical Society*, Professor W. W. Watts has published an admirable account of 'The Geological Work of Charles Lapworth, M.Sc., LL.D., F.R.S., F.G.S.*' Few people have had a better opportunity of following Lapworth's work than Professor Watts has had, and few could have summarised that work so well. The pamphlet is a fine record of a great man's achievements.

A 'B. F.' ON MUSEUMS.

A writer with the initials F. B. (though probably these should be reversed), in the *Library Association Record*, the official organ of the Library Association, has seen a circular from an American Museum, which seems to have given him an idea. He writes 'The libraries have demonstrated what they can do for commerce and industry, and one is surprised to notice that museums have hitherto made no sign to take their share in this important work. The demand for economy must force many corporations to consider whether they can go on maintaining libraries, museums and art galleries. Leicester, for instance, finds it difficult to keep the three institutions going at full time. Before the abolition of the rate limit, a museum was an excuse for levying an extra halfpenny. That excuse has now gone, and museums will have to justify their existence. With ample incomes, they might be continued on present lines as a luxury, but in an age of economy they might be regarded as a burden. Libraries are a necessity. The commercial side of museum work, properly developed, would make museums a necessity. The Philadelphia Museum buildings now cover sixteen acres, but they did not begin at that size. Their extension displays their utility, and should encourage museums in Great Britain to try to become equally useful.'

MUSEUMS AN 'EXCUSE.'

If this is the sort of drivel printed to please the readers of the official organ of the Library Association, we are sorry for that Association, especially as it is only recently that a conference was held at that Association's request, at which members of the Museums Association were invited, in order, it was alleged, for a better understanding between the two Associations. The real object was, however, as we assumed from the remarks made by a prominent Library Association official, that he had misunderstood the recent Act of Parliament; expected that the Museums were all coming under the wings of the Library Committees; and he even

* 51 pages, 2/-.

suggested that the Annual Conference of Museums Curators, as a separate conference, be dispensed with, and that a combined conference of Librarians and Museum Curators take its place. This official seemed to be as ignorant of Museums and their work as does this F.B., who apparently looks upon Museums as excuses for getting extra funds for library purposes! An idea of the *necessity* of a library is shown by the fact that in one large commercial city the Central Library, with its reference rooms, reading rooms, lending rooms, etc., was closed for a fortnight for 'cleaning.' The Museums in the same city, which are as clean as any in the country, manage to keep clean without inconveniencing the public a single half-day in the year. But Museum Curators, as a rule, endeavour to oblige the public.

MUSEUMS A LUXURY.

With regard to one part of the *Library Association Record's* effusion a writer in the *Museums Journal* for August states :— 'On present lines, museums are a luxury, according to F. B., but libraries, apparently because they "have demonstrated what they can do for commerce and industry," are a necessity. This is the ever-recurring blunder of the "practical" man, who always confuses the means with the end. Why do we steep ourselves in commerce and industry? For their own sakes entirely? Surely not. Let us take a pride in learning to do our daily work well whatever it may be, and let museums do all they can to help in practical affairs, but, for the sake of humanity, do not let us end there. On the contrary, let us bring our fellow men and women to regard the wage, or salary, or dividend-earning pursuit, in which they are engaged, largely as a way of providing themselves with the means to indulge in just those higher recreations and elevating pursuits for the furtherance of which museums and libraries alike stand.'

THE LEICESTER MUSEUM.

The reference to Leicester, in F. B.'s note, is evidently due to a grievance F. B. has respecting the people at Leicester. who, when they required a Chief Librarian recently, they appointed the Museum Curator to the office. This is rather different from the frequent procedure in the smaller towns, when the Librarian, often without any museum experience or qualification whatever, is appointed 'Curator'; usually because the 'museum' had to be kept out of the Library Funds, and was often in one or two small rooms in the Library building. But this is now being altered. Museums have no difficulty in 'justifying their existence' to the intelligent people in their respective towns, and they are gradually and properly becoming severed from the influence of Chief Librarians. As a rule, the progressiveness of a town council can be gauged by the

fact that its Museum and Library has each a different director, and not, thank heaven, placed under the care of an ignoramus, so palpably unaware of the object of a museum as is F. B.

ANOTHER LIBRARIAN'S VIEW.

To show that all librarians are not of F. B.'s opinion, we give below an extract from the address of the Principal Librarian of the British Museum, appearing in *The Museums Journal* for August. We must admit that we would rather accept Sir Frederic Kenyon's opinion on Museums than those of F. B. Sir Frederic says:—'Whatever we possess in our Museums, whether it be the one talent or the five or the ten, we want to make it effective as an element in the education of our fellow-countrymen. We want to place before them objects of beauty, objects of utility, objects of historical interest, and to press home their appeal, whether by attractiveness of disposition, or by the help of lectures, of guidebooks or of reproductions, so that the fullest effect may be given to them, and that our museums may be places of refreshment, of instruction and of inspiration. In this way we shall be serving our country, perhaps more than we know. For beauty, do we not need to make fuller use of its refining influence, to counteract whatever there is of sordid or ugly or depressing in our surroundings, and to improve the taste and elevate the thoughts of our people? For refreshment, did not many of us find during the strain and stress of the war that great art and great literature were the best forms of relaxation, the influence of which retained their strength when lesser kinds of mental recreation lost their appeal? And for history, is it not of vital importance in the present conditions of social, economic and political unrest, that the people, to whose hands the power of the State is entrusted, should be taught to realise the great past of the nation? It is the sense of historic continuity which is the best foundation for sobriety and stability in our public life. The working classes should be taught, not merely theoretic economics, but the history of their country and Empire. Upon this consciousness of the past rests the hope of continuity in the future, and the solution of our political problems by peaceful progress instead of violent revolution. Our museums can cultivate this sense, and in so doing they are playing a valuable part in the education of the people.'

THE LEEDS MUSEUM.

Extraordinary general meetings of the members of the Leeds Philosophical and Literary Society were held recently for the purposes of passing resolutions giving effect to the recent decision to transfer the Society's property in Park Row, together with the contents of the Museum, to the Corporation.

The terms have already been outlined in these columns. It was agreed by the City Council at the June meeting to take over the property. Mr. Sydney Kitson, president of the Society, presided over a meeting of the proprietary members, which disposed of the real estate, and claims and liabilities in the manner provided by the scheme, the resolution being proposed by the President, and seconded by Sir W. E. Garforth. Alderman Charles Lupton, solicitor to the Society, explained that the meeting was necessary to carry out the resolution they had already passed to wind up the old Society and form a new one, and to hand over part of their assets to the Corporation. Having decided that the Society should be dissolved the next step was to arrange for the disposal and settlement of the property of the institution, its claims, and liabilities. Subsequently a meeting of both proprietary and ordinary members was held, when a resolution was carried unanimously disposing of the museum contents in accordance with the scheme. The authorities of the Leeds University have expressed a desire to have certain duplicates and other articles in the museum, and the agreement leaves a sub-committee at liberty to meet these wishes.

MUNICIPAL MUSEUM FOR DARLINGTON.

We learn from the press that 'a long considered project in Darlington has at length become a fact in the establishment of a Municipal Museum. The Corporation, by gifts extending over many years, has come into possession of a considerable number of natural history specimens and objects of antiquarian and local and general interest, but hitherto these have been scattered in various buildings—some being housed in the Public Library, and others in the Technical College. Now the various small collections have been got together in a centrally situated building in Fulwell Road, which, until lately, accommodated the staff of the Borough Accountant, and here, with several loan collections, notably those of the late Mr. Sidney Pearson and Sir Henry Lawson, Bart., of Brough Hall, they constitute an interesting museum. The building is, perhaps, not the most suitable for the purpose that could be desired, but the best has been made of it by alteration and adaption, and it is hoped in course of time to replace it by specially erected premises.' The Darlington Corporation is not sufficiently advanced to appoint a whole-time curator for the museum, the work being left to the Librarian, Mr. Dallimore, who will no doubt do his best to look after the museum in his spare time.

THE SCARCITY OF SWALLOWS.

Dr. W. E. Collinge writes to *Nature* on this subject, and from his communication we extract the following:—'For

some years past certain ornithologists have directed attention to the decreasing number of swallows seen in the British Isles during the months from April to September. This diminution was particularly marked in 1918 and 1919, less so in 1920, but is still more apparent in the present year. For a time the scarcity was denied by many, or stated to be only of local occurrence, but the condition of affairs during the present season is sufficiently well marked to convince the most sceptical. The swallow, economically, is one of our most valuable birds, its food consisting practically entirely of insects, and any scarcity of these birds removes a most important factor in the destruction of injurious insects. The causes which have led to the scarcity are not at present all known, but there are some which have been operating for a considerable time past, and their effects are now making themselves felt. In view of the importance of the swallows, economically, the question is one calling for immediate attention and investigation, and until we know more about the matter it might be well to place this bird and its eggs under stricter protection.'

CUP AND RING MARKINGS.

Mr. C. Carus-Wilson suggests that 'cup and ring' markings which occur on 'calcareous sandstones,' etc., 'are due to molecular re-arrangement of the calcium carbonate, and not to any artistic effort on the part of prehistoric man, as is frequently supposed.' He points out that similar patterns occur on 'American Cloth' and on old oil paintings. We are not surprised that Mr. Carus-Wilson should hold these views, but we are surprised that *Nature* should publish them.

BUREAU OF BIO-TECHNOLOGY.

We have received Bulletin No. 3 of this Bureau, in which the Director, Mr. F. A. Mason, has a scholarly paper on 'Micro-organisms in the Leather Industries; a systematic arrangement of the Fungi mentioned in the literature of the Leather Technology,' and Mr. P. Hampshire describes 'a method of Determining Hydrogen Ion Concentration.' There are half-a-dozen pages of 'Notes and Comments,' etc., which are flatteringly like a certain column bearing the same title we wot of!

BARLEY PESTS.

Mr. F. A. Mason has a lengthy paper on 'Pests and Diseases of Barley and Malt, Part I., Injurious Insects,' in Vol. XXVII. of *The Journal of the Institute of Brewing*, for July. He gives startling figures as to the loss to barley crops through the depredations of insects. He concludes that to control these pests in maltings and breweries there

should be (1) vigilance in preventing the entrance of insects either by way of the barley used for malting purposes or malt introduced into the brewery from sources not under the brewer's control; (2) cleanliness in the maltings and attention to the soundness of the malting floors, walls and kiln; (3) attention to the condition of the bins, and watchfulness for first appearances suggesting infection; (4) where infection already exists, the application of some treatment more drastic than any hitherto adopted.

AMBLESIDE BIRDS.

The Headmaster of an Ambleside School writes to *Bird Notes and News* (summer number), 'We have a wonderful lot of birds this year. Our boys made a couple of nesting boxes, which they affixed to the trees. One is occupied by a Redstart, which is hatching six eggs, and the other by a Pied Flycatcher. There is a Ground Lark's nest in the wood with five eggs, a Sedge-Warbler's with six, and a Willow-Wren's with seven (a lovely nest), a Tree-creeper's with a family, a Tomtit's with a family, a Robin's with six eggs, a Wren's with seven, and one which the children call a "Miller's Thumb's" with seven. There are several Owls' nests in the neighbourhood. We can easily see into two of them, two young brown Owls in each. Three youths were fined at Ambleside for robbing a Heron's nest. We were glad they were caught and had to take the eggs back.'

WHALES.

We learn from Sir Sidney F. Harmer's useful 'Report on Cetacea stranded on the British Coasts during 1919 and 1920,'* that it includes records of the Blue Whale (*Balaenoptera masculus*), which has not previously appeared in this series. As bearing on the general distribution of Whales in the North Atlantic, it also includes a statement of the total catch at the Whaling Station in Harris during 1920, with a notice of the capture of large numbers of Pilot Whales (*Globicephala melaena*), at the F  roe Islands, in the same year. Cuvier's Whale (*Ziphius cavirostris*) has been recorded on several occasions, during the two years, and it may be considered to have established its right to be considered a not infrequent visitor to the British Coasts. The complete absence of records of any of the other Ziphioid Whales, particularly of *Hyperoodon*, the Bottle-nosed Whales, is a noteworthy feature of the two years; while another negative characteristic of the period since May, 1919, is the absence of the Lessor (sic) Rorqual (*Balaenoptera acutorostrata*), of which five records were obtained in the summer of 1918. The Common Dolphin

* British Museum (Natural History), 18 pp., 4/-.

(*Delphinus delphis*) and the Bottle-nosed Dolphin (*Tursiops truncatus*), other visitors which were common in 1918, have also been infrequent. The occurrence of a large school, estimated at 100 individuals, of the White-sided Dolphin (*Lagenorhynchus acutus*) in the Shetland Islands, in July, 1919, is of interest, while there are two records of Risso's Dolphin (*Grampus griseus*).

THE BRITISH MUSEUM.

Accompanying a view of the British Museum from the air, in a Sunday paper recently, is the information that the Museum contains 'fine collections of ancient sculpture and antique objects of interest. Specimens of early printed books and manuscripts may be found in abundance.' Such publicity must be gratifying to Sir Frederic Kenyon and the principal trustees; also to know that the exhibits are 'of interest.' It might almost give one the impression that the writer of the note, though a London journalist, had been in the British Museum, and got out again.

THE ABBEVILLE JAW.

In a series of amusing and interesting reminiscences recently published,* Mr. Henry Keeping gives the following story:—'In 1862 I paid a visit to France under the following interesting circumstances. A French geologist, M. Boucher de Perthes, described a fragment of a human jawbone and a number of flint implements as having been found in a gravel-pit at Moulin Quignon, near Abbeville. It was believed by him that they were both of the same age and were genuine, and had actually been found buried in the same gravel from which the workmen stated they had got them. Our English geologists, however, doubted the genuineness of the implements and their occurrence with the jaw; and accordingly Dr. (afterwards Sir John) Evans and Prof. (afterwards Sir Joseph) Prestwich, who were the most sceptical, asked the French Geological Society to allow them to send over a trustworthy Englishman to investigate the whole matter. I had the honour of being chosen for this mission, of which a full account was given in the *Athenæum Journal* for 1863. Sir Charles Lyell also, in the third edition of his book on the Antiquity of Man, states that my investigations proved that most of the implements were forgeries, and together with the broken jawbone had been cleverly buried in the gravel by the workmen to deceive the credulous. The whole controversy about this Abbeville human jaw is related in the "Life of Sir Joseph Prestwich," published in 1899.'

* "Reminiscences of My Life," 2nd edition, 2/6, post free, from the author, 16 Aylestone Road, Cambridge.

FOSSIL MAN*

In this sumptuous volume, Prof. Boule summarises the various evidences of fossil man in different parts of the world, and gives an admirable summary of present knowledge in this vast subject. Quite apart from his personal knowledge of French and neighbouring prehistoric remains, the author has an intimate acquaintance with the vast literature on the subject. In this latter he is most remarkably up to date; for example, he does not accept the great age of the Ipswich Skeleton—having read what has been written on the subject by Moir and Keith, as well as Moir's more recent admission that the Ipswich human remains are comparatively modern. Thus, Boule helps to correct a blunder which should never have been made. The volume has over two hundred illustrations and is remarkably cheap, especially with the present rate of exchange.

PREHISTORY.†

This volume is on similar lines to the preceding, excepting that it is confined to European evidence. The author has the advantage of being a geologist, and further he has personally examined the various caves, etc., which he describes, though it must be admitted that his photographs, which are reproduced, do not reveal the detail shown on the diagrams and sketches of the same objects. His knowledge of the collections in the French museums and his acquaintance with Prof. Boule have doubtless resulted in many of the illustrations appearing in *Les Hommes Fossiles* appearing also in *Prehistory*. Mr. Burkitt begins with chapters on recent geology—though his ideas of the various Ice Ages seem unnecessarily elaborate and complicated. The book is very well produced on excellent paper—and the numerous illustrations are given on 47 plates at the end of the volume. Generally speaking, Mr. Burkitt adopts a cautious attitude, which is commendable.

THE EARTHWORKS OF BEDFORDSHIRE.‡

In this work Mr. Wadmore brings together plans and sketches of the numerous earthworks of various dates which occur in Bedfordshire. The county is rich in these relics of early man, and by the aid of nearly a hundred illustrations their form and nature can be gathered. The author classifies the earthworks as Prehistoric, Saxon and Danish, Norman,

* *Les Hommes Fossils, éléments de paléontologie humaine*, par Marcellin Boule. Paris: Masson et Cie, 491 pp., 40 francs.

† *A Study of early cultures in Europe and the Mediterranean Basin*, by M. C. Burkitt. Cambridge University Press, pp. xx+438, 35/- net.

‡ By Beauchamp Wadmore, Bedford, 103 High Street, 270 pp., price £2 2s. od.

and later Manors and Domestic Homesteads. These last especially are worth careful consideration, as doubtless in various parts of the country, numerous 'camps,' etc., described as British or Roman, are of much later age—a well-known 'ancient British' mound in Yorkshire has recently proved to be mediæval in date. Mr. Wadmore's book is worthy of careful study, as most of the types of earthworks he gives occur in other parts of Britain. The reproductions of the author's sketches add much to the value of the work.

NORTHERN GUIDES.

Messrs. Ward, Lock & Co., have sent us their *Guides to Whitby, Scarborough, Harrogate, The English Lakes, and Edinburgh*, each of which is bound in stout cloth and is of convenient size for the pocket. Illustrations are plentiful, and maps are included on an unusually lavish scale. The guides are just what the tourist requires, and in each case the surrounding country is well described—for instance, under Harrogate are accounts of Knaresborough, Ripon, Ilkley and York. Each is sold at 2s., a price certainly far less than the cost of production. A list of the guides issued will be sent on application to the publishers.

COLLECTING.

The fourth edition of Sir James Yoxall's 'A. B. C. about Collecting,' is announced.* Every naturalist is essentially a collector, of specimens—or facts, or both, hence this volume should appeal to our readers. In natural history matters, however, frauds are not so prevalent—excepting in the way of fictitious data; but in the ordinary mode of collecting—according to Sir James, pitfalls are many, and he indicates the way in which these should be avoided, and methods of detecting the more obvious forgeries in glass, china, pottery, prints, etc. Sir James relates many interesting accounts of his experiences in collecting.

PALÆONTOGRAPHICAL SOCIETY.

The last volume (LXXII.) of the Palæontographical Society issued, contains two monographs; the first on 'The Pliocene Mollusca,' by F. W. Harmer, the second on 'The Ordovician and Silurian Bellerophonacea,' by F. R. Cowper Reed. In the former quite a number of names of the author's friends and fellow workers are perpetuated, viz., *Murex harrisoni*, *Ocenebra kendalli*, *Scala chatwini*, *Admete sheppardi*, *Turbonilla kendalli*, *Alvania cossmanni*, and *Alvania bellii*. We have not repeated the author's error in putting capital letters to these trivial names.

* Stanley Paul, 382 pp., 15/- net.

SEX HABITS OF THE GREAT CRESTED GREBE.

EDMUND SELOUS.

(Continued from page 200).

MARCH 2ND.—Walked round the Wilston reservoir and noted the following love-actions performed by various pairs of Grebes :—

Pair 1.—The two confront one another, with the nervous twitchings and jerkings (depression and then a jerk upwards) of the head, with or without contact of the bills, the facial adornments being more or less raised and expanded. Then, all at once, one makes a sudden short flight away from the other, who remains approximately where it was. Coming down, some way off, on the water, it swims back to its companion, and then the whole thing, including the flight and return, is repeated. It seemed to me fairly certain that the flight was a part of the love-play and not made to chase away a possible rival, for I could see none where the flying bird came down.

Pair 2.—The same ; but this was not quite so evident here, for now several pairs had gathered into the same reedy corner of the lake. However, I need have no doubt as to this, since I have seen the same thing gone through by a pair of the Horned Grebes, in Iceland, who had all a real lake to themselves. With them, however, there were no special movements of the head.

Pair 3.—Another instance of the weed-seizing display, or ceremony, was the same in most of its details, but not all, as those I noted down on February the 21st. As then, in one case at any rate, after the head-twitching, the two birds swam some way off, in opposite directions, but they emerged with the weed, after diving, not together, but approximately where they each went down, and swam with it to each other again. Both then stood up in the water, still holding it, and there was the characteristic tossing of the heads about, in more or less close contiguity, but whether the weed was eaten or dropped, or part one and part the other, I could not make out.

Pair 4.—Two now meet and twitch for a little, then one swims away from the other, dives and comes up, I think, with some weed, but I am not quite clear as to this. It swims to the other, and, a few minutes afterwards, again away, without anything special having taken place. Again this bird dives, and emerges with weed, on which the other assumes Huxley's 'cat attitude,' which I had thought, but wrongly, to be part of the hen's display only. Assuming this, however, to be the case, now, the male, whilst she is

thus displaying, brings her the weed, she seizes hold of it, and now the two eat it together. I can have little doubt as to this, for I see none drop on the water, yet it all disappears. During this repast—if I am not really mistaken—the pair did not stand in the water. At most, they may have stretched up, a little, whilst swimming—the male slightly more than the female—but the Penguin pose was not attained to. Here, then, the sexual passes into the gustatory, but this, after all, with food in the bill, is not wonderful. Still, it may be argued that the weed trick began by being, or, even now, is nothing more than, a courting or conjugal presentation of food, by the male to the female, or by each to the other, which would account for the more usual double nature of the performance. But why, in that case, should so ordinary an act be combined with the most salient of all the poses indulged in by this much-posing species, which, however, it must not be forgotten, was absent on this occasion. Why, too, the state of excitement in which the birds are clearly seen to be, when thus displaying—or behaving—with the weed in their bills, more especially when held between them? Why should it so often not be eaten, and why, lastly, later in the season, should apparently this appropriation of weed act as an incitement to coition on the nest? This I have seen with the present species, and have good reason, at least, to infer in the case of the Horned Grebe also. The weed was not eaten, nor did there seem to be any idea of doing so, on these occasions. Though it is perhaps possible that all this may have grown out of the inter-gifts of dainty morsels, yet, having regard to the fact that the nest is made entirely of weed, thus brought up from the bottom, I am still inclined to see the origin of these actions in the association in the birds' minds between sexual desire and the nest-building instinct, the cause of such association being, as I believe, the growth of the latter out of the former.* Of course, birds, as men, whatever their state of mind, must eat, so that the two things may have no connection with each other.

Pair 5 (as I think, but, possibly, pair 4 again).—Another instance in which the birds did not stand or even raise themselves, at all, in the water, with the weed in their bills. Both went down, and came up with it, but one first and then the other. The first to do so was the male (some way on the left of the female) more than once, and the first time, at any rate, instead of taking it to the female, he swallowed some or all of it. This, then, may have been mere ordinary feeding. The female, meanwhile, had disappeared from the scene,

* My later observations on the conjugal habits of the Dabchick have tended greatly to strengthen this view.

and it was not till after the male had again dived and brought up more weed, which he, this time, let drop on the water, that she reappeared, swimming towards him, from a long way off, and on the left of him, now, instead of the right. She must have made, therefore, a long dive, passing right under him. She brought the weed to the male, exactly, in appearance, as though to the nest. There was then, as I say, no stretching up, with it, and very little enthusiasm. The male but just touched it, if at all, and the female soon let it placidly fall on the water. Here, then, we have the weed without the 'trick'; but even thus lopped, the sexual element must, I think, have entered into it, at least with the female. The preceding remarks apply equally, here, and it is, I think, quite understandable that no amatory associations, at this period, should produce the semblance of a hymeneal journey to a nest not yet in being. This, however, would not preclude the possibility of the nest, itself, being built under the influence of such associations, as is somewhat suggested by this last procedure of the female.

It would appear that all the love-antics of the Great Crested Grebe are performed by both the sexes. Both 'sit brooding on the charmed wave,' and both dance the 'ghostly Penguin-dance.' The first of these two, on the part of the one bird, would appear to be the orthodox occasion of the second on that of the other; but this is not always so. The male (or whichever of the two it is, to whom it seems proper to make this dramatic emergence) may come up quite in the ordinary way, some little way off, and then merely swim to the female. In short, both in the posturings themselves and the combinations of them, as between the pair, there are just those gradations and differences which the Darwinian theory of evolution demands, but which Fabre, who had nothing behind observation but wonder, dismissed from the field of inquiry, either as being less rationally provocative of that feeling than any culmination, when considered alone, or for some other reason, not so apparent. And in the treatment of the problem of sexual selection, at any rate, Fabre has had a very fair following.

Putting all I have yet observed together, we may perhaps gain some insight into the probable origin and philosophy of the 'shaking-bout,' as witnessed in its highest development by Huxley. Let us suppose that these Grebes, like various other birds—Pigeons and Gulls to go no further—were, from the first, accustomed to neb or bill, a habit which, though it may now be obsolescent, yet still exists amongst them. But they had, also, the ordinary toilette habit of preening, rather strongly developed, whether through necessity, merely, or partly also, as a nervous habit. Especially they often preened

their throat or upper breast, and as the head was again raised, after having been sunk to allow of this, it was given a twitch or jerk, or two, which combined action became habitual. This perhaps is not very strange, for those same constitutional causes which produced preening, in other parts, would probably have done so, to a special degree, had it been possible, amongst the sun-flower-like feather-wealth of the head, set delicately on its slender, bending stem, the neck. No bird, however, can preen its own head. To twitch, or shake it, therefore, is perhaps the next best thing it can do, until the matter, becomes sufficiently urgent for the employment of the foot, and this, if carried to any undue degree, would be hardly compatible with the welfare of the species. Whatever the link, or even if there is none, we at any rate have, as Huxley has shown, this habitual combination of throat or breast-preening, and head-twitching or shaking.* Starting from that, I have elsewhere put on record† the amount of hesitation there habitually is, in these Grebes when intending to pair, which produces a large number of abortive pilgrimages to the nest, for this purpose. The nervous emotional state of the birds seems, as it were, to have carried them to the brink of the act, but a further uprush of sexual desire is necessary to take them over it. Let us suppose that with a pair of them about to neb, there was, in the past, before head-shaking had become fully developed, the same thing. There would then have been continual pausings on the threshold of the contemplated action, and these were filled up (pauses must be filled up, in some way) with a greater or lesser number of preenings of the throat or breast, mostly—sometimes elsewhere—and twitches, or slight shakes, of the head. So much was this the case that such half-nervous movements began seriously to interfere with the nebbings till, at last, the birds, being unable to prevent themselves falling into them, came to accept them, first, as a subsidiary, then, as the more important, and finally, as now, perhaps, in a majority of cases, the sole object of their comings together. Such a process would, of course, have gone hand in hand with a corresponding increase both in such motions and the pleasure derived from them, till, at last, the principle of sexual selection concentrating, as it were, on the head-shakings, may have carried this to the pitch which Huxley has seen, but I, not being able to stay on longer, have not. In this way, actions which were, at first, merely nervous or alleviative, or both

* *Loc. cit.*, p. 515. If, as I have surmised (see *ante*) preening alone, without head-shaking, fills up the pauses before coition, this is interesting, as shewing a suspension of the lesser sexual (as it has now become) by virtue of the greater; but the argument is left unaffected.

† *Zool.*, May, 1901, p. 165, etc.

one and the other, might have passed, by degrees, into those of display, and sexual display would, through sexual selection, have brought about the growth of the head-lappets and facial disk, with their special powers of erection and expansion. Thus all would have gone together, the motion, set up through an acquired nervous habit, or trick, the pleasure experienced in that motion, which, in its highest development, may be equivalent to the rhythmic one of dancing, and the enhanced beauty, as a result of this.* Also, as the pleasure would be remembered, this would add conscious to involuntary impulse, in the initiation of the movement. That there are stages in the want felt and the expression attained to, in the satisfaction of it, is quite plain from watching the birds, but it is not so easy to say whether such differences distinguish some individuals from others, or are common to all of them—whether some only, or all, at some time, really dance with the head and neck, or do little more than twitch or jerk it. Probably, however, it faces both ways.

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The Annual Report of the Spalding Gentlemen's Society for 1920 contains an interesting list of additions to the Society's Museum.

Mrs. Hester Forbes Julian, F.G.S., favours us with reprints of two of her contributions to the *Journal of the Torquay Natural History Society*. The first deals with 'The Scientific work and travels of Henry Forbes Julian,' her husband, a traveller and well known as a metallurgist, who was lost with the *Titanic* in 1912; the second refers to 'The Scientific Correspondence of Charles Kingsley and William Pengelly,' the latter being her father. She gives many interesting facts respecting these two well-known naturalists.

Messrs. Sampson, Low, Marston & Co. have issued a 'Bridlington Souvenir' (100 pp.) in connexion with the National Union of Teachers' Conference at Bridlington this year. Its general 'get-up' is rather poor, compared with some N.U.T. souvenirs we have seen; but this may be due to the present conditions of printing, etc. Among the articles contributed, we notice 'Prehistoric Bridlington,' by T. Sheppard; 'Nature Round Bridlington,' by J. F. Robinson; 'East Yorkshire Folk and Speech,' by A. N. Cooper; 'The Cliffs, the Sea-Birds and the Climbers,' by T. Audas; and 'The Yorkshire Wolds,' by W. H. Blakeston.

* Since both the beauty and the action by which it is displayed, in a special manner, are here common to both sexes, sexual selections must be assumed to have acted on both of them. It is inter-sexual selection, as I have called it (with arguments) in my work, 'The Bird Watcher in the Shetlands,' Chap. XXX. I think it has yet to be shown, as against such affirmative evidence, that this joint form of sexual selection cannot have been brought about through the general action of that principle, as set forth by Darwin. It is true that Darwin himself did not believe so, but only because sufficient evidence was then wanting, not because he considered the two incompatible. The contrary, I think, appears from his brief reference to the point ('Descent of Man,' 1888 Edit., Vol. I., p. 348). His was a speculative rejection merely. He thought it unlikely.

In Memoriam.

GEORGE FREDERICK WRIGHT.

English geologists, and especially those interested in the Glacial problems of the country, will regret to hear of the death of George Frederick Wright, of Oberlin, Ohio, at the age of eighty-five.

Professor Wright was one of the pioneers in connexion with the efforts formerly made to prove that the Glacial deposits of his country, and ours, were the results of land-ice as against 'submergence,' and thirty years or so ago, with Warren Upham in America, and Kendall and others of this country, discussions were continued at the meetings of various scientific societies, and in the geological papers, on this subject. We think we can say, without fear or hesitation, that their efforts proved successful, and that now-a-days, excepting as the result of an occasional aberration, little is heard of the 'submergence' theory, the Noachian deluge, or other exploded falacies.

Professor Wright paid frequent visits to this country, and made many friends among the geologists here. The present writer can claim an intimate acquaintance with him for over a quarter of a century. Not only did Professor Wright contribute scores—one might almost say hundreds—of articles to the press, but he was the author of many standard works dealing with the more recent geological phenomena. So long ago as 1892 he wrote 'Man and the Glacial Period,' one of the 'International Scientific Series,' in which an epoch-making chapter on the Glacial Geology of the British Islands was contributed by Kendall. That book may be looked upon as the foundation of the recent school of Glacial Geology, and was in many ways a valuable production. Professor Wright's other books include 'The Ice Age in North America,' a substantial volume which has reached its fifth edition; 'The First Crossing of Greenland,' 'The Origin and Antiquity of Man,' 'Scientific Confirmations of Old Testament History,' and, in our last year's volume, we reviewed his latest work, 'The Story of My Life and Work.'

Latterly, Professor Wright's attentions were more devoted towards endeavouring to prove that the various miracles, etc., referred to in the Bible can be accounted for scientifically, and he made excursions to Palestine, etc., for the purpose. While he was always a courteous correspondent, a hard worker and a voluminous writer, we look with the greatest satisfaction to the years during which he was expounding the Land Ice theory.—T.S.

YORKSHIRE NATURALISTS AT WENTWORTH.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.SC.

IN spite of an overcast morning, the meeting of the Union at Wentworth on July 7th was favoured with glorious, if somewhat tropical weather. Members started from various points under the leadership of Messrs. E. G. Bayford, T. Baldwin and A. Kay, and also had the advantage of being piloted to places of particular interest by Earl Fitzwilliam's keepers. The day's proceedings were enlivened by the abundant historical associations of the locality, especially its connexion with Thomas Wentworth, Earl of Strafford. Equally striking were the pre-Roman earthworks in Scholes Coppice. Although the dry weather had burnt up much of the vegetation, it was possible to make a thorough examination of various ponds and of the lakes in the park. There members had the pleasure of seeing a Kingfisher, and of watching the evolutions of a pair of Great Crested Grebes.

Although the area traversed lies on the Middle Coal Measures, and many of the prospects are spoilt by mines and waste heaps, Dr. Woodhead drew attention to the successful manner in which these heaps have been planted with timber. Many, if not most of the woods visited, occupy sites of this type.

At the meeting in the evening, the Rev. W. Dyer being in the chair, a vote of thanks was passed to Earl Fitzwilliam for his kindness in permitting the Union to visit the estate, and in placing keepers at the members' disposal. The following observations were recorded by the various sections represented :—

BOTANY.—On the drying mud of several of the ponds, the alga, *Botrydium granulatum* was present in fair quantity, and a curious straight-beaked form of *Carex flava* was also gathered. The following were also present :—

<i>Ranunculus sceleratus</i>	<i>Agrostis alba</i> var. <i>coarctata</i>
<i>Scutellaria galericulata</i>	<i>Typha latifolia</i>
<i>Carex remota</i>	<i>Equisetum limosum</i>

In Hood Hill plantation ferns were abundant, and the varieties *pseudo-mas* and *paleacea* Druce, of the male fern, were both present. *Genista anglica* was seen on a partly colonised waste heap, and the spreading of *Epilobium angustifolium* along the railways was very noticeable.

BIRDS.—The following birds are worthy of mention :—Kingfisher, Sandpiper, Great Crested Grebe, Chiff-chaff, Coot, Water-hen and Tufted Duck.

COLEOPTERA.—This group was represented by :—

<i>Notiophilus biguttatus</i> F.	<i>Meligethes aeneus</i> F.
<i>Loricera pilicornis</i> F.	<i>Helmis mangel</i> var. <i>aenea</i> Müll.
<i>Platynus assimilis</i> Payk.	

HYMENOPTERA.—Few species were noticed, but lack of variety was more than balanced by the number of individuals of *Vespa vulgaris* L., whose unwelcome attentions were unwittingly invited by a member of the party stepping over a nest.

NEUROPTERA.—

<i>Ischnura elegans</i> Lind.	<i>Chrysopa perla</i> L.
<i>Euallagma cyathigerum</i> Charp.	

TRICHOPTERA.—Larvae of one or more species were seen in a small stream between Scholes and Wentworth.

LEPIDOPTERA.—The Red Admiral and two other species of butterfly were seen, viz., *Pieris napi* L., and *Epinephela janira* L.

The commonest moth was undoubtedly *Agrotis pronuba* L., but *Baptia atrata* L., *Selidosema repandata* L., and *Pterophorus pentadactylus* L., were also recorded.

HEMIPTERA.—Mr. J. M. Brown was unable to join the excursion to Wentworth, but was there on July 26th; and he reports he collected a number of Hemiptera, and gives the list :—

HETEROPTERA :—

<i>Derephysia foliacea</i>	<i>Calocoris bipunctatus</i>
<i>Nabis flavomarginatus</i>	<i>Lygus pabulinus</i>
<i>Anthocoris confusus</i>	<i>L. cervinus</i>
<i>A. nemorum</i>	<i>Dicyphus epilobii</i>
<i>Acompocoris pygmaeus</i>	<i>D. stachydis</i>
<i>Miris holsatus</i>	<i>Aetorhinus angulatus</i>
<i>Teratocoris antennatus</i>	<i>Mecomma ambulans</i>
<i>Monalocoris filicis</i>	<i>Cyrtorhinus caricis</i>
<i>Malacocoris chlorizans</i>	<i>Psallus fallenii</i>
	<i>Plagiognathus arbusiorum</i>

Homoptera :—

<i>Philaenus spumarius</i>	<i>Limotettix antennata</i>
<i>P. lineatus</i>	<i>L. 4-notata</i>
<i>Batracomorphus luno</i>	<i>L. sulphurella</i>
<i>Idiocerus confusus</i>	<i>Cicadula 6-notata</i>
<i>Acocephalus nervosus</i>	<i>Alebra albostrigella</i>
<i>Athysanus obsoletus</i>	<i>Empoasea smaragdula</i>
<i>Deltiocephalus ocellaris</i>	<i>Eupteryx urticae</i>
<i>D. abdominalis</i>	<i>E. pulchellus</i>
<i>D. pulicaris</i>	<i>E. concinna</i>
<i>Thamnotettix diluvior</i>	<i>Typhlocyba ulmi</i>
<i>Zygina flammigera</i>	<i>T. crataegi</i>

DIPTERA.—Mr. Chris. A. Cheetham writes :—The general opinion seemed to be that diptera were far too numerous, one species, *Hydrotaea irritans* Fln., came in clouds about our heads, but if this had been cleared away surprisingly few would have been seen. By vigorous use of the sweep-net a good number were collected, and on working over these a fair list of additions to the County list is available (these are indicated by an asterisk). Seeing how scanty records are for this area, a full list is given, as it will give some idea of the species available early in July in a similar type of locality. Taking the most striking families first, one brilliant *Sargus* (*S. iridatus* Scop.) was caught, of the Syrphids few individuals were seen, the list being :—

**Chilosia pulchripes* Liv. (P.H.G. has previously verified this for me from Adel.)

Platycheirus manicatus Mg., *scutatus* Mg., *albianus* F., *scambus* Staeg., *immarginatus* Ztt., *fulviventrus* Mcq., *clypeatus* Mg.

Pyrophæna granditarsa Forst. *Liogaster metallina* F.

Syrphus venustus Mg., *grossulariae* Mg., *ribesii* L., *vitripennis* Mg., *balteatus* Deg., *cinctellus* Ztt.

Sphegina clunipes Fln. *Volucella pellucens* L.

Eristalis intricarius L., *pertinax* Scop., *horticola* Deg.

Helophilus pendulus L. *Xylota segnis* L.

On first arriving among the trees by the lake-side a number of gnats were disturbed, a conspicuous species being the imago of the Phantom larva, *Corethra plumicornis* F., others being *Culex pipiens* L., *Chironomus plumosus* L., and two other species which appear to belong to *C. brevitibialis* Ztt., and *Tanytus punctipennis* Mg., when tested by Wingate's tables.

Many additions to our list are among the daddy long legs, and here I have to thank Mr. F. W. Edwards for assistance where his initials are appended :—

**Dicranomyia mitis* Mg. (F.W.E.) *Ptychoptera albimana* F.

Limnobia nubeculosa Mg., flying in threes or fours in the mouths of large rabbit burrows.

**Symplecta stictica* Mg.

**Limnophila lineolella* Verr. (F.W.E., several localities.)

**Pachyrrhina quadrifaria* Mg.

teralis Mg.

stream bed in Scholes coppice, *L. lutea* Pz., being taken in the sweep-net, and a single specimen of *Callimyia speciosa* Mg.

Psilopus platypterus F.

Dolichopus plumipes Scop., *popularis* W., *griseipennis* Stan., *brevipennis* Mg., *aeneus* Deg.

**Syntormon pallipes* F.

Campsicnemus curvipes Flin.

The few members of the rapacious Empid family seen were :—

Hybos femoratus Müll.

**Hilara lurida* Fln. (J.E.C.), *interstincta* Fln.

Ocydromia glabricula Flin.

**Ardoptera irrorata* Flin.

A single ♀ of *Thereva nobilitata* F., one or two *Leptis lineola* F., a few *Chrysopilus cristatus* Verr., one Tachinid *Siphona genticulata* Deg., and two muscids, *Morellia simplex* Lev. and *Pyrellia eriophthalma* Mcq., leave only the Anthomyidæ and Acalypterate muscidæ to deal with. I am indebted to Mr. J. E. Collin for assistance with the latter as with some of the Empidæ.

Polietes lardaria F., *albolineata* Fln.

Phaonia (*Hyetodesia*) *pallida* F., *erratica* Fln., (R.H.M. Coll.), *basalis* Ztt., *palpata* Stein. (*Spilogaster trigonalis* Mde.).

Calliophrys (melanochila) riparia Flin.

Macrochris (Caricea) intermedia Fln. *Pogonomyia meadii*.

Hydrophoria conica W.

Coenosia sexnotata Mg.

Anthomyia pluvialis L.

Pegomya nigratarsis Ztt.

Fannia (Homalomyia) coracina Lw. (R.H.M. Coll.)

Azelia cilipes Hal.

Spathiophora hydromyzina Fln.

Scatophaga suilla F., *stercoraria* L.

Helomyza laevisfrons Liv.

**Clusia (Stomphastica) flava* Mg. (J.E.C.)

**Sciomyza trunnipes* Mg. (J.E.C.), **dorsata* Ztt.

Tetranocera elata F., *laevifrons* Liv., *ferruginea* Fln., *coryleti* Scop.

Calobata petronella L. *Palloptera usulata* Fln.

Sapromyza rorida Fln. *Lauxania aenea* Fln.

Balioptera tripunctata Fln., *combinata* L.

Opomyza germinationis L.

Sepsis cynipsea L.

Notiphila riparia Mg., *Cinerea* Fln. *Hydrellia griseola* Fln.

Parhydra quadripunctata Mg., *aquila* Flin.

Meromyza Sps. Mr. Collin says this is identical with one in his collection at present unnamed

Centor ceresis Flin.

Chlorops speciosa Mg. (J.E.C.), *hypostigma* Ztt.

Crassiseta (elachiptera) cornuta Flin.

Agromyza geniculata Flin. (*capitata* Ztt.) (J.E.C.)

Paranthomyza nitida Mg.

Borborus equinus Fln.

**Phora abdominalis* Fln. (I.E.C.)

In addition to the help given me by Messrs. Collin and Edwards, I have had the opportunity of comparison with R. H. Meade's collection at the Leeds University, and also the very useful type collection presented to the Union by Mr. Percy H. Grimshaw.

YORKSHIRE NATURALISTS AT REDCAR.

F. A. MASON, F.R.M.S.

REDCAR was the centre selected for headquarters at the 293rd Meeting of the Yorkshire Naturalists' Union, held on Saturday, June 11th. The meeting had been fixed with the intention of re-investigating the Estuarine beds of the district, famous for their fossil plant-remains, but the difficulties of travel during a critical period of the coal strike prevented anything like a representative gathering on this occasion. On arrival of members from the south, a party under the guidance of Mr. M. L. Thompson, of Middlesbrough, set out for the quarries on the side of Upleatham Hill. As had been anticipated after a recent reconnaissance by Mr. J. J. Burton, the site of the quarry that had formerly yielded so much valuable palæobotanical material was found to be an almost impenetrable jungle of shrubs, surrounded by thickly-planted conifers. Geological examination was impossible, and the removal of offending debris by blasting was out of the question on account of damage which would occur to the plantation. One could only stand in contemplation of conditions as they had been. The ground then under our feet was classic, and that fact was the only satisfaction to be derived from the visit. From that locality had been obtained plant remnants of the Jurassic Age that had given rise to the study of fossil botany, but it was only too evident that from this particular quarry, at any rate, nothing more could be expected. As pointed out by Mr. Hamshaw Thomas, the following ferns had been obtained in this locality:—*Sagenopteris Phillipsi* var. *major*, *Todites Williamsoni*, *Cladophlebis denticulata* and *Marattiopsis anglica*. Cycadean fronds had been represented by *Ptilophyllum* species, *Taeniopteris vittata*, *Nilssonia mediana* and *Dictyozamites Hawelli*, while *Baiera longifolia* and *Czekanowskia Murrayana* among the Ginkgoales, and *Taxites zamoides*, belonging to the Coniferales had also been discovered. No specimen of any of these was found during the excursion, but as other quarries on the same horizon are being developed in the direction of Old Marske, it is possible that sooner or later new portions of the plant beds may be revealed, and lead to their re-discovery.

Meanwhile the entomologists had taken the opposite direction, working along shore towards the South Gare Breakwater. There was too much wind, however, to do serious work, and except for a number of Diptera taken by Mr. Chris. A. Cheetham, little was obtained in the way of results. Mr. W. H. Burrell examined the same district for mosses without noting anything except the most commonly occurring species.

Among the flowering plants seen on the Marske excursion, *Habenaria viridis* was the most noteworthy.

On Sunday the day was spent in examining the district between Coatham and the South Gare Breakwater, which included the enormous slag heaps that now cover the large area enclosed by the Tees Conservancy Commission, together with Sand Dunes and Salt Marshes. The botany and ornithology of this area proved particularly interesting to the naturalist whose studies are, perforce, mostly confined to inland districts, and although no rarities were found, the plant associations, as will be seen from the list of constituent plants, provided sufficient material to occupy attention.

Among the birds, a breeding colony of the Lesser Tern was found near the Breakwater, and observation of the birds at close quarters excited a good deal of interest. A day or two later, through the kindness of Dr. Robinson, of Redcar, Mr. W. G. Bramley, the ornithological member of the party, was able to see five nests of this Tern. Ringed Plover were numerous, and on one occasion a flock of 25 to 30 birds was observed; a pair of the same birds piped and fed within a few yards of the party

while an al fresco lunch was being consumed. Herring Gulls, a Cormorant and other common sea birds were also noted.

After dinner, a meeting was held at headquarters, the Coatham Hotel. Seven affiliated Societies were represented by members from York, Leeds, Huddersfield and Ferrybridge; the Cleveland and North Eastern Societies being represented by Mr. E. W. Jackson. Sectional Reports on the work of the week-end were given by Mr. H. E. Wroot, Mr. Greevz Fysher, Mr. W. G. Bramley, Miss R. McIlroy and the writer.

Votes of thanks were unanimously accorded to Lord Zetland, the Tees Conservancy Commission and the Cleveland Golf Club for their kindness in granting permission for members to visit their estates; also to G. C. Heslop, Esq., for facilities afforded to members at the quarries. The members present were indebted to Mr. J. J. Burton for making arrangements at short notice, with Mr. M. L. Thompson, who kindly acted as guide on the previous day.

FLOWERING PLANTS.—Miss R. McIlroy contributes the following notes:—The Sand-dune formation showed an association of strand plants, the marram-grass, and fixed dune associations. In the association of strand plants were found:—

<i>Arenaria peploides</i>	<i>Salsola Kali</i>
<i>Spergularia media</i>	<i>Glaux maritima</i>
<i>Cakile maritima</i>	

In the marram-grass association were found:—

<i>Ammophila arenaria</i>	<i>Festuca arenaria</i>
<i>Elymus arenarius</i>	<i>Agropyron junceum</i>
<i>Carex arenaria</i>	<i>Cakile maritima</i>
<i>Phleum arenarium</i>	<i>Glaux maritima</i>
<i>Festuca rubra</i>	<i>Aster Tripolium</i>

In the fixed dune association were seen:—

<i>Festuca rubra</i>	<i>Sagina maritima</i>
<i>Equisetum arvense</i>	<i>Geranium molle</i>
<i>Silene inflata</i>	<i>Hieracium Pilosella</i>
<i>Erodium cicutarium</i>	<i>Leontodon hirtus</i>
<i>Lotus corniculatus</i>	<i>Medicago lupulina</i>
<i>Trifolium repens</i>	<i>Matricaria inodora</i>
<i>T. procumbens</i>	<i>Arenaria serpyllifolia</i>
<i>Potentilla Anserina</i>	<i>Galium saxatile</i>
<i>Sedum acre</i>	<i>Ononis repens</i>
<i>Plantago media</i>	<i>Diplotaxis tenuifolia</i>
<i>P. Coronopus</i>	<i>Astragalus danicus</i>
<i>P. lanceolata</i>	<i>Arctium Lappa</i>
<i>P. major</i>	

On a small patch of muddy sand, sheltered from the sea by low dunes and only occasionally washed by the salt water, the following halophytes were found:—

<i>Spergularia media</i>	<i>Plantago maritima</i>
<i>Salicornia europaea</i>	<i>Glyceria maritima</i>
<i>Aster Tripolium</i>	

In a small pond further inland were found a few fresh-water and marsh plants:—

<i>Lemna minor</i>	<i>Alisma lanceolatum</i>
<i>Polygonum amphibium</i>	<i>Carex vulpina</i>
<i>Spiraea Ulmaria</i>	

On pasture land, in the hedgerows were seen, along with commoner plants, the following:—

<i>Rhinanthus Crista-galli</i>	<i>Senecio aquaticus</i>
<i>Habenaria viridis</i>	<i>Sisymbrium Irio</i>
<i>Reseda lutea</i>	<i>Poterium Sanguisorba</i>
<i>R. luteola</i>	<i>Tragopogon pratensis</i>

Symphytum officinale
Lysimachia nemorum
Galium Cruciatum
Caucalis arvensis

Stachys sylvatica
Viburnum Opulus
Tamus communis
Luzula sylvatica

FUNGI.—The routes traversed were not very suitable for the collection of fungi, and of something like a dozen species noted on the excursion only two are worthy of mention. An Agaric with an unusually long mycelium which came away with the toadstool, was found by Mr. H. E. Wroot growing in the loose sand of the Dunes. In its immature state it was thought to be a species of *Amanitopsis*, but after development in the vasculum it was found to be a pink-spored species, *Volvaria speciosa* Fr. The specimen was forwarded to Mr. A. Clarke, who confirmed its identity. It is an interesting fact that this species has been recorded from similar situations on the Sand Dunes of both North and South Lancashire by H. Wheldon. *Pleurotus ostreatus* Jacq. occurred abundantly on an Elm tree at Upleatham.

DIPTERA.—Mr. Chris. A. Cheetham reports that the flies of the shore and sand hills, especially the former, made up in number of individuals for the scarcity of species; two species of *Fucellia* Dsr., *F. fucorum* Fln., and *F. maritima* Hal., with *Actora aestuum* Mg., occurring in great numbers on the decaying seaweeds, etc., at and above the tide marks. The strong wind and absence of sunshine restricted the collection from the sandhills, but two insects which are additions to the Yorkshire list—*Pipunculus littoralis* Bkr., and *Chortophila albula* F. (*arenosa* Ztt.), were plentiful. Another species which is not in our list, but which Wingate gives for Redcar, *Mydaea protuberans* Ztt. (*Caricea exsul* Ztt.), was also fairly abundant. The common Blue Bottle here was *Protocalliphora groenlandica* Ztt. Perhaps the date was early for diptera such as were taken on the Spurn sand-hills in 1919, when the meeting was in August, for *Cynomyia*, *Anthrax* and *Philonicus* were sought in vain. The Asilids were represented by *Dysmachus trigonus* Mg., and the Therevidae by the silvery-haired ♂'s of *Thereva annulata* F., considering the high wind it seems certain that the district would yield many additions and interesting records if worked on good days at varying dates, and our Middlesbro' members ought to find their efforts in this direction amply repaid.

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Aspects of Plant Life, by R. Lloyd Praeger. London. S.P.C.K., The Macmillan Co., 1921, 207 pages, 6/- net. 'I got up the mountain edge, and from the top saw the world stretcht out, cornlands and forest, the river winding among meadow-flats, and right off, like the hem of the sky, the moving sea.' With this appropriate quotation Mr. Praeger begins his wide survey of plant life, selecting Farleton Fell as his outlook post. He deals especially with the British flora, but when his eye reaches the fringe of the shore he is tempted away to exotic deserts, and illustrates a dozen types of desert plants by a coloured frontispiece. Fortunately he rarely wanders far afield, and gives a really interesting survey of the natural history of British plants in chapters dealing with plant associations, migration, interrelations of plants and animals, plants and man, and plant structure. In a chapter on 'past and present,' he deals very effectively in small space with the complex problem of the origin of the flora, and the author produces evidence in favour of the view that many species survived the rigours of the ice-age, and that our flora was not so completely blotted out as some geologists would have us believe. A final chapter deals with saprophytes, parasites and alpine plants, concluding with a brief reference to the three stages in the origin of a land flora, the invention of chlorophyll, the migration from water to land and pollination through the medium of the air, 'which won for them the freedom of the land.'

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 204).

Gen. *Scotina* Menge, 2-2.
(*Agroeca* Westr. *ad partem*).

S. celans Bl.

A rare spider with habitat similar to *A. brunnea* Bl., reported from Devon, Dorset, Surrey, Sussex, N. Wales, Northumberland and Cumberland; an adult ♂ Grange-over-Sands, August, 1903; Leinster and Munster, in Ireland; abroad, France, Germany, N. Italy, Austria and Switzerland. *Adult* late summer and autumn, some ♀s surviving the winter.

V.C. 63.—Carr Wood, Woodsome, Huddersfield, on Storthes Hall side, two adult ♀s, January, 1910 and August, 1911, on a damp bank, one ♀, August, 1918.

S. gracilipes Bl.

An uncommon spider widely distributed in Gt. Britain as far north as Culbin Sands, Forbes, N.B.; rare in Ireland; Point of Ayre, Isle of Man, July, 1908, ♂s; abroad France, Switzerland and Croatia. *Adult* as in previous species.

V.C. 61.—Houghton Woods, Market Weighton, one ♀, May, 1915, T.S.

Gen. *Micariosoma* Sim., 1-2.

M. festivum C. L. Koch.

Widely distributed in Great Britain as far north as Perthshire; also in Leinster and Munster, Ireland; of general occurrence on the continent; amongst moss and débris and under stones, sometimes associated with ants. *Adults* in May, ♀s later also.

V.C. 63.—Wilsden, R.B., a female, May, 1907, an example I have not seen, but named by the Rev. O. Pickard Cambridge.

Gen. *Micaria* C. L. Koch, 1-3.

M. pulicaria Sund.

Of antlike form with iridescent tints in reflected light; beneath stones and amongst grass, sometimes with or near ants. Widespread in Gt. Britain as far north as Moray Firth, and on the Continent, but apparently rare in Ireland. *Adults* throughout the year. First occurrence—the author, Slaithwaite, June, 1898.

V.C. 61.—Skipwith Common, Allerthorpe Common, Bielsbeck, Humber shore at Welwick and between the Joint Dock, Hull, and Saltend Common, Spurn, T.S.

V.C. 62.—Eston and Lonsdale, from nests of *Donisthorpia nigra*, J.W.H.; Bickley, near Scarborough, H.C.D.; near Whitby and Staintondale, R.A.T.; Kildale Woods, W.P.W.; Tees mouth; cliffs south of Scarborough.

V.C. 63.—Harden, Cottingley Wood, Saltaire, Hurst Wood (Shipley), W.P.W.; Bingley Woods, R.B., W.P.W.; Clayton, near Bradford, T. St.; Askern, T. S.; Crimsworth Dene with *Formica rufa*, R.B.; Varley Road, Jerusalem farm, Hill Top, Merridale, Pole Moor, Cupwith, all in the Slaithwaite district; Dean Head; Drop Clough; Wessenden Valley; Standedge; Meltham; Helme; Wilshaw; Farnley; Crosland Moor; Butternab Wood; Kirkheaton; Langsett. In many of these places found in loose association with ants.

V.C. 64.—Grassington, R.B.; Adel Moor; Washburn Valley.

Fam. AGELENIDÆ, 8-16.

Gen. *Argyroneta* Latr., 1-1.*A. aquatica* Latr.

The 'water spider' with a wide distribution in the British Isles, and noted in many parts of Europe, including S. Russia; affixes to water-weeds beneath the surface of ponds and ditches a transparent bell-shaped retreat, which it fills with air, and in which it lives. *Adult* July to September. First occurrence—J. Grassham, Frost Dam, between Methley and Normanton, 1854-5, recorded in the *Naturalist*, 1881, December, p. 84.

V.C. 61.—Ryde Street Brickponds, Hull, H.M.F., later, T.S.; marl pits at Market Weighton, G.B.W., (Trans. Hull F. Club, 1908); T.S. (H.M.P. No. 59); Saltend Common, T.S.; Line Ponds, Skipwith Common, J.F.; very plentiful in all these localities.

V.C. 62.—Ayton, J.W.H.

V.C.—63.—Frost Dam, J.G., *see above*; Knottingley.

V.C. 64.—Askham Bog, abundant, W. D. Roebuck, *Naturalist*, December, 1881; and others. Austwick Moss, Clapham, two females, one adult, in a peaty pool, C. Waterfall, there 1916, Mr. A. R. Sanderson, and in plenty.

Gen. *Tegenaria* Latr.,* 2-5.*T. derhamii* Scop.

The 'house spider' abundant everywhere in neglected corners of buildings, etc., inside and out; of cosmopolitan distribution. *Adult* from May to September. First record—? R. H. Meade, not definitely located but mentioned as if found in Bradford in 'Gossip on Spiders,' *Zoologist*, 1860, pp. 7146-7151.

T. silvestris C. L. Koch.

Commoner in the south than in the north of England and noticed in many localities as far north as Cumberland and Northumberland absent from Ireland; abroad noted for France, Switzerland, Hungary and the Tyrol.

V.C. 64.—Calverley, an immature example, W.P.W., August, 1908. An adult is needed to confirm this record. The finder favours me with the following note:—'Below stones near the mill by the station. The particular stone was in the private roadway which runs through the mill to the gasworks.'

Gen. *Tetrax* Sund., 1-1.*T. denticulata* Oliv.

Widely distributed in the British Isles (Dorset to Sutherland), and on the Continent; in crevices or beneath top stones of walls, screes of stones, occasionally wandering. *Adult* ♂ May and June, ♀s most months of the year. First record—Martin Lister, Craven, De Araneis, 1678, p. 67.

V.C. 62.—Middlesbrough district, 'common on the moors,' J.W.H.; Beast Undercliff, Staintondale, T.S.; Snever Moorland, near Coxwold, W.E.L.W.; Hackness and Raincliff Woods, R.A.T.; Boulby.

V.C. 63.—Cottingley, W.P.W.; Earby, F.R.; Dungeon Wood (Shipley), J.A.B.; Almondbury; old lane, near Lepton Great Wood (Huddersfield); Netherton; Denby Dale.

* *T. atrica* C. L. Koch has occurred twice in Yorkshire, V.C. 63 (1) Barnsley, one ♀ in a public house, specimen forwarded by E. S. Bayford; (2) Huddersfield in a timber yard, *vide Naturalist*, March, 1913, p. 136.

- V.C. 64.—Grassington, W.P.W., W.F.; Gargrave, F.R.; Howden Ghyll, R.B.; W.P.W.; Sawley, S.M., W.F.; Airton; Goredale; Kilsney; Ingleton, Ingleborough and Dale Beck.
 V.C. 65.—Dent and Rawthey Valley, F.B.; Middleham

Gen. *Coelotes* Bl., 2-2.*C. atropos* Walck.

A common spider in the north of England and parts of Scotland, but only occasional in the South of England; 1 ♀, Isle of Man, 1908; absent from Ireland; usually under stones, occasionally amongst débris; abroad, France, Switzerland, Hungary. *Adult* ♂ in spring, ♀ throughout the year; a pair taken *in cop.*, September, 1911. First record—R.H.M., Yorkshire, S.G.B.I., Bradford, V.C.H. "Taken when out with Mr. Meade, near Bradford, October, 1857," Rev. O. P. Cambridge, *Zoologist*, 1859, p. 6499.

- V.C. 61.—Speeton, ♀, and Birkhill Wood (Cottingham), im. ♀, T.S.; Bubwith, ♀, J.F.

V.C. 62, 63, 64.—Numerous stations in each, especially common in the hillier parts.

- V.C. 65.—Rawthey Valley and Dent, F.B.; Coverham, W.E.L.W.; Upper Teesdale, Y.N.U.; Buttertubs Pass; Bainbridge; Jervaulx.

C. terrestris Wid.

A rare British spider, the few other records being for the south of England and Berwickshire; the following were all named by the Rev. O. Pickard Cambridge. I have not seen a Yorkshire example. First record—R. Gilchrist, *Naturalist*, June, 1906.

- V.C. 62.—Cayton Bay, 1 ♀, R.G., the third occurrence in Britain; Scarborough, 1 ♀, *Naturalist*, August, 1908, H.C.D. It is not stated whether these were adult or not.

- V.C. 64.—Arnccliffe, T.St., an immature female.

Gen. *Cicurina* Menge, 1-1.*C. cinerea* Panz.

A rare spider but now reported from nine widely separated English counties, Dorset, Kent, Surrey, Sussex, Essex, Cambs., Durham, and Northumberland; abroad, France, Switzerland and Central Europe; beneath stones or in dark out of the way places and may easily escape notice. *Adult* autumn. First occurrence—T. Stainforth, Saltend, October, 1908.

- V.C. 61.—Saltend, ad. ♂, T.S.; Southfield Pits, near Hessle, two adult ♀s, E.A.P.

- V.C. 63.—Hurst Wood, Shipley, 1 ♂, N. Airey; Saltaire Seven Arches, ♀, J.A.B.

Gen. *Cryphoeca* Thor., 1-3.*C. silvicola* C. L. Koch.

Occurs freely in Scotland and the north of England, but becomes scarcer farther south, reaching Norfolk on the east and Glamorgan and Gloucestershire on the west; generally distributed throughout Ireland and with a wide range on the Continent from the north of Norway to the south of France, Hungary and Croatia and extending eastward to Siberia; beneath bark of trees or among débris on the ground. *Adults* throughout the year. First occurrence—the author, Drop Clough, December, 1900.

- V.C. 62.—Cleveland, 'every locality visited,' J.W.H.; Kildale, G.B.W.; Falling Foss, W.P.W.; Silpho Moor, near Scarborough, R.A.T.; Castle Howard, J.F.

- V.C. 63.—Harden, W.P.W.; Mayroyd Wood, Hebden Bridge, D. Sutcliffe; Drop Clough (Marsden) preferring the tangled

mass of decaying vegetable matter, green mould and soil at the roots of ling and bilberry; near Pole Moor; Scout Wood (Merridale); Honley Old Wood; Storthes Hall Wood; Marsden Clough and Morton Wood (Holmfirth); Upper Stones Wood (Stockmoor); Hebden Bridge.

- V.C. 64.—Malham, T.St.; Ilkley, R.B.; Ingleborough, Keighley Burley-in-Wharfedale, Saltaire, W.P.W.; Knaresborough district, Y.N.U.; Sawley district, S.M., W.F.; Ingletton; Grassington; Airtion; Stainforth Force; Harewood Park.
- V.C. 65.—Upper Teesdale, Y.N.U.; Semmerdale; Whitfield Force.

Fam. HAHNIIDÆ, 5-6.

Gen. *Antistea* Sim., 1-1.

A. elegans C. L. Koch.

A hygrophilous species haunting sphagnum bogs and other damp places; widely distributed in the British Isles as far north as Moray Firth and on the Continent in the N., W., and Central countries. *Adult* May to September. First occurrence—the author, Standedge, July, 1899.

- V.C. 61.—Weedley Springs (S. Cave), 2 ♀s, Allerthorpe Common, ♂, and Brantingham, T.S.; Skipwith Common, many both sexes.
- V.C. 62.—Normanby Intake Plantation, J.W.H.; Eston Moor, ♀; Ringingkeld Bog, Cloughton; Scalby Mill.
- V.C. 63.—Hurst Wood (Shipley), W.P.W.; common in most of the sphagnum bogs amongst the hills in the Huddersfield district, Standedge, Pule, Clowes Moor and Wessenden Valley (Marsden), Chew Valley (Greenfield), Booth Banks (Slaithwaite), Meltham; Broad Oak (Linthwaite), both sexes in a dry barn (carted in with hay).
- V.C. 64.—Brim Bray and High Moor, Sawley, S.M., W.F.; Adel Bog; Ilkley.

Gen. *Hahnia* C. L. Koch, 4-5.

H. helveola Sim.

A rare British spider which has occurred in N. and S. Wales, Dorset, Staffs., Cheshire, Lake District, Northumberland; Lanarkshire and Rannoch (Scotland); absent from Ireland and known elsewhere in three European countries, France, Germany, Switzerland. *Adult* April to October. First occurrence—the author, Butternab Wood, September, 1900.

- V.C. 61.—Brantingham Dale, 1 ♀, T.S.
- V.C. 63.—Calverley, 1 ♀, S.M.; Deffer Wood (Cawthorn) 1 ♀; Butternab Wood (Huddersfield), a few ♀s; Bottoms Wood (Slaithwaite), one ♀; Drop Clough (Marsden), end of April and beginning of May, 1907, adult and imm. ♀s abundant in cavities of the ground under stones, and in October adults of both sexes near the old quarry, less plentifully on other dates.
- V.C. 64.—Giggleswick Scar, 1 ♀.

H. nava Bl.

Rare in Ireland but widely distributed and sometimes abundant in England and Scotland; abroad, France, Corsica, Austria, Hungary, Germany, Sweden; at the roots of herbage, under stones and on railings and walls. *Adult* May to August. First occurrence—T. Stainforth, Bielsbeck, August, 1908.

- V.C. 61.—Bielsbeck, 1 ♀, T.S.
- V.C. 62.—Basedale, Easby Moor and Gt. Ayton, 1 ♀ at each place, J.W.H.; Langdale End, near Scarborough, 1 ♂, R.A.T.

(*To be continued*).

FIELD NOTES.

BIRDS.

Early Arrival of the Swift.—Referring to Mr. Fortune's note on page 254, in the Wilsden district odd individuals arrive in April, but at rare intervals. Its departure, however, is very much more erratic, for while most of them leave somewhat early, individuals are often to seen very late in the season, for this species.—E. P. BUTTERFIELD.

Early Arrival of the Cuckoo.—Mr. Fortune heard the Cuckoo on the 18th April, this being the earliest date he has for that district. I note that Mr. Fortune, in announcing the Cuckoo's arrival, writes, 'I heard *him*,' which can leave no one in doubt as to the sex of the bird he heard, but I would like to ask, can Mr. Fortune, or anyone else, be absolutely sure that the female Cuckoo does not occasionally utter the well-known cry, 'Cuckoo' ?—E. P. BUTTERFIELD.

The word 'him' was used inadvertently in an impersonal sense. I am not certain that the female does not utter the well-known cry. I think she does. Some years ago when photographing from a tent near Filey, I witnessed at some distance away what I took to be the act of copulation between two cuckoos, after which they flew away in different directions, both calling 'cuckoo' as they flew. This, of course, is not conclusive, but in my own mind I was quite satisfied that in this case both the male and the female called.—R. FORTUNE.

Fulmar Petrels at the Farne Islands.—It is interesting to note in connexion with the movement of Fulmar Petrels on the East Coast during the breeding season, that in the years 1919, 1920 and 1921, several of these birds frequented the cliffs of the Farne. In company with my friend Jasper Atkinson, I spent several days on the Farne group in July of this year. We were four days on the Farne. Upon our arrival, we were told about the Fulmars, but although we kept a careful look out, and especially in the evening, we were not lucky enough to get a sight of them. The watchers told me that Miss Mary Best, a competent observer, had seen them. I therefore wrote to her, and she kindly informs me that she saw four birds at least. She spent one afternoon under the lighthouse wall from 2 p.m. to 8.30 p.m., and saw two brown birds sailing past the cliff frequently, as if wishing to land, and at 8-30 a bird flew out of the cliff just below her. The boatman from Holy Island, who was with her, and knew the bird well, had seen them fishing between Holy Island and the Farnes since April, and has seen them about there during and since 1919. I spent a week on the island

in July, 1919, several days on the Farne, but did not hear about any Fulmars that season.—R. FORTUNE.

Short Eared Owl and Crossbill in the West Riding.—

In the latter half of May of this year, while out in search of a Merlin's eyrie on the moors of the Skipton district, together with the Rev. Tomlinson and a gamekeeper, I had the good fortune to put up a Short Eared Owl from its nest. It contained only two young, one recently hatched, the other probably a fortnight old. The nest consisted merely of a capacious scrape in the ground under an isolated clump of aged ling outflanking quite an extensive bed of this plant. It contained, in addition to the young, three recently killed mice. The old bird behaved in an unusual manner for this species, and flapped lazily off over the opposite hillside, and we saw no more of her. Owing to rain I did not have my camera with me, and hence made a return trip two days later, this time in company with the keeper only. To our disappointment the nest was empty. This time, at all events, by shifting its young, the bird had lived up to the reputation of its kind. We searched for an hour in hopes of finding the new site, but without luck. Owing to the lengthy walk involved we did not repeat the attempt. But the day was by no means wasted, for *en route* for the owl, we had to skirt a large coniferous wood. Half-way along it, up the fell-side, I heard a familiar Canadian birdnote. I was so surprised that it took me some moments to place it—Crossbill. I promptly called a halt, and together we waited for a glimpse of the bird. In a few minutes we were rewarded with a magnificent view, at but a few yards distance, of a fine male in full red plumage, doing gymnastics in characteristic fashion round some cones on a projecting branch. We had intentions of hunting for a possible nest on our return, but thunder and heavy hail unfortunately prevented this.—WM. ROWAN.

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MAMMALS.

Food of the Wild Rabbit.—A wild rabbit at large in Newsome Allotments has developed a rather unusual diet. Succulent vegetables are abundant, but so far, much to the disgust of the lover of flowers, it has preferred to commit havoc amongst Stocks and Asters, and, in my plot, it has dwarfed considerably *Clarkia*, *Phlox drummondii* and seedling pinks.—W. E. L. WATTAM.

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Margaret W. Rea writes on 'Stomata and Hydathodes in *Campanula rotundifolia* L., in their relation to environment ; Margaret Benson writes on 'The Grouping of Vascular Plants,' and W. Stiles on 'Permeability,' in *The New Phytologist* for June 30th.

GLACIATION OF THE SOUTH DOWNS.*

THE study of the Ice Age or Ages and of the Pleistocene Period as a whole is always fascinating on account of its intimate and direct connexion with the scenery as we know it, and with the history of man. Much work has been done in recent years, and we are gradually approaching a clearer conception of the physical history and vicissitudes of England as far south as the Thames Valley, beyond which true glacial deposits have not been recognised. What was happening in the Wealden area and on the south coast is a difficult question, and one well deserving the attention of competent geologists. Unfortunately we cannot congratulate Mr. E. A. Martin on his paper on 'Glaciation of the South Downs.'

His 'first leanings towards the idea that the Downs were fashioned in the outline that they now present by the aid of glaciers was caused by a sense of the inability of any agency other than ice to give to the Downs the rounded forms that they present'; he regards the Downs as 'merely magnified roches moutonnées covered with turf,' although he recognises that 'they have each one become rounded to such a form as no other kind of rock would have assumed.' We would ask Mr. Martin what agency could give to Chalk Hills any other form than that of rounded downs. Clement Reid has suggested that under a cold climate the chalk surface would be frozen, and therefore impervious, to account for certain features in some of the chalk valleys, but Mr. Martin invokes glaciers to explain what Reid and any geologist would regard as typical chalk scenery produced under normal conditions. Having made his fundamental assumption, Mr. Martin seeks to support it by a mass of observations and references to authorities, but after reading his paper several times, we must confess to utter bewilderment; indeed, we can hardly believe that he has himself arrived at any consistent theory. He makes much of the blocks, sarsen, conglomerate, etc., 'enormous erratics' easily accounted for if 'solid water be admitted as their means of transport'; but while he regards them as transported by glaciers which carved out the downland valleys, he also quotes Searles Wood, who 'thought that during the formation of the Boulder Clay of Central England, the Weald was covered by the sea. If so, is it to be supposed this sea was not the home of ice-bergs and ice-floes?' Has Mr. Martin made up his mind between the rival claims of a marine submergence and of an ice-sheet with glaciers, or has the summer of 1921 so affected him that anything cold will suffice?

Again, his scheme, if he has one, has not been adjusted to any chronological sequence; sometimes he distinguishes the post-Mousterian cold period, which produced the Coombe Rock, from an earlier glaciation at the close of the Acheulian (!) period, sometimes there is only one which appears to follow closely on a Pliocene marine planation. It is only by careful and patient work that a consistent account of the Weald and the Downs during the Pleistocene period will be reached. As Mr. Martin quotes George Borrow (*sic*) on the Pliocene of the Chilterns, we recommend him to turn his attention to the 'Bible in Spain,' and leave geological subjects to geologists.—C. N. B.

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A Book about Plants and Trees, by R. and S. G. Gurney. London: C. A. Pearson, Ltd., pp. xvi. and 103, 1/6 net. Boy Scouts and Girl Guides are to be congratulated on having had prepared for their use this simple book about plants, which serves as a text book for those wishing to qualify for the Naturalists' Badge. The book is divided into four parts, dealing respectively with the life and food of plants, an account of five plants as examples of life histories, how to group plants in a nature diary, and, lastly, a description of thirty different species of trees. There are many helpful outline drawings, and the descriptions are not only simply and pleasantly written, but much more reliable, and the teaching is on sounder lines than usual in a popular treatise.

* By Edward A. Martin, in *Trans. S.E. Union of Sci. Soc.*, for 1920.

NORTHERN NEWS.

The death is announced of Col. H. W. Feilden, naturalist and student of glacial geology.

A specimen of *Oxigrapta literana* L., is recorded for Lancashire (*The Entomologist*, August).

R. Standen writes on 'Squirrels eating Fungi' in *The Lancashire and Cheshire Naturalist* for June, received August 1st.

Miss N. F. Layard has found a 'Prehistoric Cooking-place in Norfolk,' which she considers to be neolithic in date (*Nature*, July 14th, p. 623).

D. C. Campbell writes on 'The Time of Singing of Birds,' and Prof. G. A. J. Cole on 'The Meteorite of Crumlin, Co. Antrim, 1902,' in *The Irish Naturalist* for July.

The Geographical Teacher, No. 59, includes 'Forms of Mediæval Settlements in England,' by W. Page; and 'The Iron Industry of South Wales,' by A. E. Trueman.

The Museums Journal for August contains Sir Frederic Kenyon's Presidential Address to the Museums Association delivered at Paris, entitled 'Museums in Modern Life.'

At a recent meeting of the Entomological Society of London, Mr. H. J. Donisthorpe exhibited two examples of *Cionus* new to science, swept near Lake Windermere a few years since by the Rev. Canon T. Wood.

Part XI. of Witherby's *Practical Handbook of British Birds* appeared on July 18th (Vol II., pp. 177-256, 4/6 net). Besides the usual descriptions of birds, it contains an excellent coloured plate of the heads of various swans and geese.

What is erroneously described as 'the finest example of a neolithic flint axe-head hitherto found in this (Harrogate) neighbourhood' is referred to in *The Yorkshire Archaeological Journal*, No. 102. One at least, much finer, is figured in Hull Museums Publications, No. 88, p. 3.

H. B. Booth has a note on the Status of the Arctic Tern in Lancashire and the Farnes, in *British Birds* for July. In the same Journal, T. L. Smith has an illustrated paper on 'Ringed Plover's Nests,' and C. E. Alford on 'Diving Ducks: Some Notes on their Habits and Courtship.'

We have received Bulletin No. 2 of the Carmichael Medical College, Belgachia, India, which contains two valuable and exceptionally well illustrated papers, (1) 'Polyporaceæ of Bengal,' by S. R. Bose; (2) 'Infusoria from the Environment of Calcutta,' by Professor E. N. Ghosh.

British Birds for August contains 'Notes on the Little Tern and Young,' 'Some rare birds breeding in Lincolnshire,' 'Breeding of Great Spotted Woodpecker in Cumberland,' 'Little Owl in Lancashire,' 'Fulmar Petrel in Yorkshire,' and 'A Sixteenth Century Portrait of the Pheasant,' with illustrations.

The Commons and Footpaths Preservation Society recently issued its Report covering the years 1913 to 1919, the Society having decided to suspend its annual publication until after the war. The present Report is quite a substantial record of the manifold activities of this useful Society, and convinces us that it is worthy of every possible support.

Discovery has made another discovery—a new editor—Mr. E. Livening, whose first editorial is in praise of his predecessor. Otherwise the journal is much the same. The proprietor, Mr. John Murray, who has made the appointment, informs us that Mr. Livening is 'the author of *Attack* (a description of his experience as an infantry officer in the Battle of the Somme), and well known for his contributions to fiction.'

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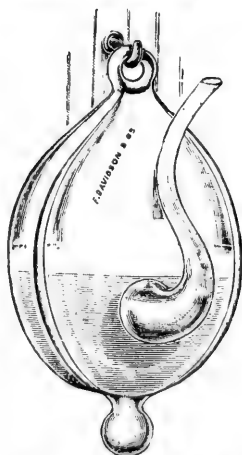
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Sept. 1st, 1921.

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.E.S.A. Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

GEOLOGICAL SECTION.

President : Dr. A. GILLIGAN, F.G.S.

THE Annual Meeting of the Section will be held in the Technical College, Huddersfield, on Saturday, October 8th, 1921, at 7 p.m.

Members and Associates of the Union are invited to attend and to bring notes, specimens, lantern slides, etc., Will officials of Affiliated Societies kindly notify their members.

A Field Excursion will be held in the afternoon to Slaithwaite and Meltham. Train leaves Leeds at 1-25 p.m., Slaithwaite arr. 2-50 p.m.

A Research Excursion will be arranged for the following day, starting from Huddersfield for the investigation of the goniatite fauna of the neighbourhood.

JOHN HOLMES (*Hon. Sec.*),
Crosshills, Keighley.

CONCHOLOGICAL SECTION.

THE date of the Conchological Meeting will be October 8th, at University House, Leeds, at 3 p.m. Professor Garstang will give a Lecture on 'The Life History of Lamellaria and Echinospira.'

F. RHODES, *Secretary*.

BOTANICAL SECTION.

ANNUAL MEETING at Leeds University, on October 15th, at 3-30 p.m.

BUSINESS:—Annual Report ; Selection of Officers for 1922.

Mr. W. H. Burrell, F.L.S., will read a paper on 'Bryophytes as indicators of water hardness.'

VERTEBRATE SECTION.

President of the Section : S. H. SMITH, York.

Two meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, October 22nd, 1921.

BUSINESS AT THE AFTERNOON MEETING.—(a) To consider and pass Sectional Reports for 1921 and to elect Officers for 1922 ; (b) the General and Financial Reports of the Yorkshire Wild Birds Protection Acts Committee for 1921, and to elect Officers and Committee for 1922 ; (c) the Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1921, and to elect this Committee for 1922.

The following papers will be given :—

"Notes on the Distribution of the Lesser Horse-shoe Bat,"

H. B. Booth, F.Z.S., M.B.O.U.

"Notes on the Turtle Dove," S. H. Smith.

AT THE EVENING MEETING the following papers will be given, with lantern slides :—

"Some Notes on the Farne Islands," Riley Fortune, F.Z.S.

"The Great Skua and Arctic Skua in Shetland," E. Chislett.

"The Great Skua and Arctic Skua in Orkney," T. M. Fowler.

E. WILFRED TAYLOR (*Hon. Sec.*),
10 Tilford Terrace, York.

Any Member or Associate Member of the Yorkshire Naturalists' Union is invited to attend any of the above meetings, and to bring notes, specimens, lantern-slides, etc., or matter of interest connected with the work of the Section, and to take part in any discussion.

Will officials of Affiliated Societies kindly notify their members?

NOTICE.—Secretaries of Sections, and Conveners of Committees, are requested to forward revised Lists of Officers and Members immediately upon completion to the Secretaries, Yorkshire Naturalists' Union, The University, Leeds.

For further Notices see p. 3 of cover.

NOTES AND COMMENTS.

ENGLAND'S PLAYGROUND.

With the above title the North Eastern Railway Company has issued an attractive pamphlet dealing with 'Holiday Attractions 'twixt Humber and Tweed,' which contains illustrations of many charming collecting grounds dear to the hearts of northern naturalists, one of which we are able to reproduce herewith. At the end are two fine bird's eye



Aysgarth Falls.

views, in colours, (erroneously described as 'contour maps'), on one of which the Spurn lights have slipped into Kilnsea.

LINCOLNSHIRE NATURALISTS.

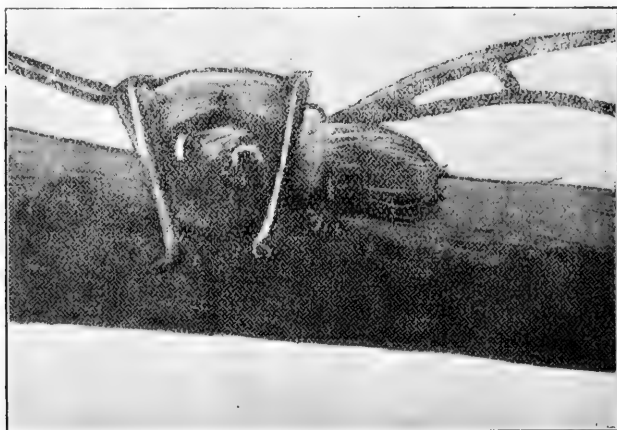
The place of honour in the *Lincolnshire Naturalists' Union Transactions* for 1920 is given to J. F. Musham's Presidential Address on 'Some Molluscan Ways.' In this he gives many anecdotes connected with his shell-collecting experiences, extending over many years. There are Sectional Reports on Conchology (J. F. Musham), Entomology (G. W. Mason), Vertebrate Zoology [birds] (W. S. Medlicott), Botany (E. A. Woodruffe-Peacock), Geology (H. Preston). There are notes on 'Otters at Grantham' (H. Preston); 'Lincolnshire Lepidoptera,' by H. C. Bee; and 'Reed Warblers and Cuckoos,' 'The Mouse-coloured Bat,' and 'Dropped-Eggs,' all by the recorder for Botany. G. W. Mason pays the usual penalty for being a President, and has two pages devoted to his career, (with portrait).

CHESTER AND NATURAL SCIENCE.

We should like to congratulate the Chester Society of Natural Science, Literature and Art, which was founded by Charles Kingsley in 1871, on attaining its jubilee, and on the publication of its valuable 'Fiftieth Report and Proceedings,' (48 pp). This Report contains statistics, etc., indicating the Society's many activities, as well as useful reports of the year's work in various branches of science, literature and art.

WHAT IS IT ?

We have previously drawn attention to the ridiculous illustrations of natural history objects which are appearing in a prominent daily paper. We reproduce below another



'A WEIRD-LOOKING CREATURE is this noctule bat, photographed by Capt. C. W. R. Knight, the tree-climbing film photographer. It is seen taking cover with its young.'

which has just appeared, together with the inscription underneath, with or without which we defy anyone to identify the specimen.

LANCASHIRE AND CHESHIRE ENTOMOLOGISTS.

The energetic Lancashire and Cheshire Entomological Society, whose work we have frequently alluded to in these columns, has issued its Forty-second, Forty-third and Forty-fourth Annual Reports in one cover.* Besides the full records of the three years' meetings, the Reports contain Coleoptera, 1917, by J. R. le B. Tomlin; Notes from Cartmel Fell (Presidential Address), by R. Wilding; Lepidoptera, 1919,

* 84 pp., 4/-, obtainable from the Hon. Secretary, W. Mansbridge, 'Dunraven,' Church Road, Wavertree, Liverpool.

by W. Mansbridge ; The Lepidoptera of Wicken Fen (Presidential Address), by S. P. Doudney ; A Year's Collecting of Macro-Lepidoptera, by S. Gordon Smith ; and a further instalment of Lancashire and Cheshire Lepidoptera. Some years ago the Society published a list of the Coleoptera of the two counties. A supplement has now been prepared, and will be sent to any Yorkshire subscriber to the first list, on application to Mr. Mansbridge.

BRITISH MAMMALS, ETC.*

Messrs. Warne & Co. have published a remarkably cheap volume dealing with the British vertebrate fauna, (with the exception of the birds which have already been described



The Harvest Mouse.

recently by Coward, in two handsome volumes, published by the same house). The present work is from the pen of Edward Step, well known to our readers, and his descriptions are illustrated by more than a hundred plates, nearly half of which are coloured.

BRADFORD AND EDUCATION.

We should like to congratulate the Director of Education in Bradford upon the excellent way in which he is helping the various scientific societies in his city, as by so doing he is certainly helping forward the cause he has so much at heart—education. He has issued the Summer Programme of the 'Federation of Educational Societies,' the scope of which

* 'Animal Life of the British Isles.' A Complete Pocket Guide to the Mammals, Reptiles and Batrachians of Wayside and Woodland. By Edward Step. London : F. Warne & Co., 184 pp., 10/6 net.

may be gathered from the foreword :—‘ This Federation of Educational Societies in the City has been formed with the object of preventing the clashing of dates or the over-lapping of the subjects dealt with ; of issuing this joint-programme ; and of taking any other joint action which seems desirable from time to time. The starred lectures in the list of any Society may be attended free of charge by the members of any other Society in the Federation, on production of a card of membership. Opportunity will be taken from time to time to include in the Official Monthly Journal issued to teachers, references to the Lectures and Meetings of the Societies named herein. The Federation has been very helpful in the institution of Interesting Leisure Evenings for Adults at various centres in the City, and of Summer Excursions in connexion with them.’

BRITISH MYCOLOGICAL SOCIETY.

The Society’s *Transactions* just issued, and edited by Carleton Rea and J. Ramsbottom, form a substantial contribution to Mycology, and contain many papers of considerable value. There is the Presidential address of T. Petch, on ‘ Fungi Parasitic on Scale Insects ’; and the same author contributes ‘ Studies in Entomogenous Fungi.’ J. Ramsbottom writes on the ‘ Minehead Foray,’ and on ‘ Californian Bees.’ With regard to the Ginger Beer Plant, the author states ‘ As all the correspondents insist on this “ American Plant ” being a new species, I propose to humour them by calling it *Zingibeerophora spumacephala*.’

OTHER PAPERS.

Other papers include ‘ Minehead Mycetoza,’ by G. Lister; ‘ Portlock Mycetoza,’ by N. G. Hadden; ‘ Minehead Lichens,’ by H. H. Knight; ‘ The Sporulation of Gonidia in the Thallus of *Evernia prunastri*,’ by R. Paulson; ‘ Three Fungi Imperfecti,’ by J. S. B. Elliott and H. C. Chance; ‘ Two New Basidiomycetes,’ by H. Bourdot; ‘ New British Hymenomycetes,’ by A. A. Pearson; ‘ New or Rare British Discomycetae,’ by C. Rea; ‘ The Ocellus Function of the Subsporangial Swelling in *Pilobolus*,’ by A. H. R. Buller; ‘ Life History and Morphology of *Urocystes cepulae*,’ by T. Whitehead; ‘ The Inheritance of Disease-Resistance in Plants,’ by F. T. Brooks; ‘ New or Rare British Fungi,’ by M. Wilson; ‘ Audibility of the Spore discharge in *Otidea leporina*,’ by R. B. Johnstone. We are glad to see that several of the contributors are ladies. The price of the publication is 12/6, which is very reasonable, and it can be obtained from the Cambridge University Press.

‘ OBSESSION ’ v. THEFT.

A ‘ well-built young man of nineteen,’ living some distance from Hull, recently rode into Hull at midnight, armed with

wire cutters, made his way through one of the parks to the aviary, cut his way through the wire, caught the two pet ravens, twisted their necks, and then walked into the arms of the police, to whom he stated, 'I am interested in natural history. I am making a collection of the rook family, and I have obtained all the species except ravens, which are very difficult to obtain, and I decided to fetch these, *not thinking I was doing anything wrong*. I was going to measure them, weigh them, sketch them, and then have them stuffed to add to my collection.' It was pleaded that he was a 'moral defective,' and 'if he became possessed of a passion for a particular thing, had not the power to resist the impulse.' The justices placed the young man on probation, and ordered him to pay the Hull Corporation £10 damages and costs. It is perhaps as well for some of our Museum friends to bear in mind what a 'moral defective' is, in case of accidents!

COPPER IN CRUSTACEA.

We notice from the *Report of the Scottish Marine Biological Association*, that recently 'Mr. R. Elmhirst and Dr. J. H. Paul commenced investigations on the distribution of copper throughout the moulting cycle in the blood and glands (hepatic) of the Decapod Crustacea. It has been found that as moulting approaches, the animal accumulates a considerable amount of the metal in its "liver," and that this is released into the general circulation when the shell is cast. It is also noted that the amount of copper present varies very much throughout the group. Whereas in the Macrura it may represent 5 per cent. of the ash of the gland, in the Brachyura it is only present in traces. In *Lithodes*, a creature intermediately placed, it is found that the maximum amount is about $2\frac{1}{2}$ per cent.

FOXGLOVES.

The Transactions and Journal of the Eastbourne Natural History, etc., Society, for July, contains the following note:— 'One of our Hon. Members, Miss E. Bray, the well-known botanist, sends us the following note which well illustrates the proverb that "It is an ill wind that blows nobody any good." One does not expect plant life to break records in a drought':—'With the kindly assistance of Mrs. Green the following measurements were taken of a bed of Foxgloves in Folkington Wood, June 28th, 1921. Length of bed 176 yds. Average breadth 40 yds. One of the highest plants 7 ft. 3 ins., with a probability of reaching 8 ft., as 50 blossoms were still to open. The number of flowers grown on this stem was 151. On far the greater part of the ground the plants were closely packed, and even in the few open spaces they were not unrepresented.'

' BRITISH ' POTTERY MADE BY ' FLINT JACK.'

T. SHEPPARD, M.SC.

MANY years ago I was greatly puzzled by the extraordinary shape and decoration of a somewhat barrel-shaped vase



FIG. 1.—Vase in the Hull Museum.

figured by Thomas Wright in his 'Essays on Archæological Subjects' (1861, Vol. I., page 29), and I made frequent endeavours to trace the vessel, but without success. Some years later, when visiting the late Miss Cape at Bridlington, she showed me a very fine collection of flint implements of extraordinary design and remarkable workmanship, which had been made by 'Flint Jack,' who was a familiar visitor to the house in which her father (the author of a History of

Bridlington) lived. Many of these specimens, which she handed over to me, and are now in the museum at Hull, are figured on the plates of flint implements accompanying a paper on ‘The Remains of a Primitive People in the South East Corner of Yorkshire: with some remarks on the Early Ethnology of Britain,’ which appeared in Vol. III. of *The Proceedings of the Yorkshire Geological and Polytechnic Society* (1856), the author in this case also being Thomas Wright. Subsequently, I figured a number of the more extraordinary of these flints in *The Antiquary*, the article being reprinted in ‘Forgeries and Counterfeit Antiquities’ as Hull Museum Publication No. 54, 1908.



FIG. 2.—Vase in the York Museum.

At the same time Miss Cape gave me a curious cylindrical vase made of reddish pottery, smoothed on the outside, and decorated in an altogether impossible manner for British Pottery, the decoration consisting of concentric circles, and triangles and lozenges one within the other. I recognised that the vase was the one illustrated by Wright, and Miss Cape told me that her father had bought it from Tindall, who had bought it from ‘Flint Jack,’ who stated that he had discovered it in a ‘tomoloo,’ (Flint Jack’s idea of the singular of the word ‘tumulus’) near Bridlington. It appeared that £5 was paid for this treasure, which was kept on a chimney-piece in a room not often used. Unfortunately (or fortunately!), one day it was accidentally knocked down from the shelf, and fell on to the hearth, where it broke into numerous pieces. These

were carefully gathered together, and on Flint Jack's next visit he was asked to repair the pieces. He subsequently returned the pot in excellent condition, though showing traces of cracks, for which he received 30s. A considerable time afterwards when the fire-place, which was rarely used, was being cleaned out, a large part of the base of the original vase was discovered, and there was no corresponding space in the 'restored' specimen. This made the owner suspicious, and he awaited Flint Jack's next visit, when he challenged him with the unfortunate discovery, and asked him how he had so accurately restored the vase with this large piece missing. He received a calm reply to the effect that it was 'easier to make another one.' We have this vase and the broken piece exhibited together in the Museum (see Fig. 1).

Recently, when I was going round the Museum at York with Dr. Collinge, he drew my attention to a 'British Vase' which had unusual decorations, which I had not seen previously, but I was able to tell him, to his surprise, that I had a similar one made by the same man, and that I knew the man's name! This York vase, which had been in the Museum a considerable time, bears a label 'found in Stainton Dale, near Scarborough, in 1845, from the Wardell collection, Leeds: purchased.' There are also two notes in the handwriting of the late Canon Raine, (1) 'Make up a side not touching the rim,' and (2) 'To be taken down and restored.' I understand that inside are some broken species of pottery which evidently could not be made to fit during the restoration. The vase is $2\frac{3}{4}$ inches high and $4\frac{1}{2}$ inches in diameter, and, as will be seen from the accompanying illustration (Fig. 2), has many points in common with the example at Hull.



Large Trout near Whitby.—On August 22nd, Mr. W. Lawson, Sleights, hooked and landed a brown trout weighing 4 lb. $4\frac{1}{2}$ oz., from water owned by the Misses Yeoman, The Woodlands. This is believed to be a record for the River Esk for freshwater trout.—F. SNOWDON, Whitby.

Plants in the Scilly Isles.—While on a visit to the Isles of Scilly, I observed on the north-east coast of St. Martins, *Diotis maritima* in abundance, and in one part of St. Agnes *Spiranthes spiralis* was so common it was impossible to walk without treading on them. This orchid seems rather common on all the islands, but on St. Angles it is remarkable. The Hottentot Fig (*Mesembryanthemum edule*) seems common on most of the islands; in fact, there are several varieties of this plant all over the islands.—W. BALMFORTH HALEY, Ravensthorpe, September 1st, 1921.

VEGETATION OF DRYING MUD AND RETARDED GERMINATION.

E. J. SALISBURY.

THE object of this communication is to call attention to the vegetation of a type of habitat which, from its nature, is apt to be of inconstant occurrence, and for which reason it is the more desirable that observations should be placed on record when opportunity offers.

The past three years, and particularly 1919, were especially favourable to observations on exposed mud owing to the low level of the water in most ponds and reservoirs during the summers of these years.

The data here given are chiefly based on examination of two reservoirs in Hertfordshire, viz., Little Tring Reservoir and Elstree Reservoir, and one, viz., the Welsh Harp in Middlesex. All three supply the Grand Junction Canal, and, owing to the withdrawal of water during the summer months are liable to considerable fluctuations of water level. In the year 1919 the entire portion of the Welsh Harp east of the Midland Railway was drained completely, except for the main channel, and the mud floor became covered with vegetation. In the same year the shallower part of Elstree Reservoir was similarly drained, though the plant covering was not so continuous, whilst the deeper and larger area of water was so much reduced that Potamogetons, such as *P. perfoliatus* and *P. coloratus*, were completely exposed. The first noteworthy feature is the character of the succession, which was essentially similar in all three localities. It should be stated that the mud thus colonised appears to differ but little, the observed natural water content being from 65—80%, with a rich supply of electrolytes, including nitrates, and a reaction which was slightly or even appreciably alkaline (Ph. 7·2—7·6).

The pioneer on the very soft freshly exposed mud was *Vaucheria*, the species, when found in fruit, being *V. sessilis*. Near the waters edge, if no more water be withdrawn, the *Vaucheria* may persist, but elsewhere it diminishes with the decreasing water content of the surface crust. Occasionally *Cyanophyceae* have been noted as pioneers accompanying or even replacing *Vaucheria*. These appear to be mostly species of *Lyngbya*.

The next phase in the succession is the appearance of *Botrydium granulatum*. This alga occurs in such vast numbers that, both at Little Tring and at the Welsh Harp, it was seen covering many square yards like a carpet of green dew-drops, but so closely packed that each individual had assumed a hexagonal form in plan.

In this connexion it is pertinent to recall the observation

of West (Algae. Camb. Bot. Handbook, 1916, p. 416), that 'It seems highly probable that some form of resting spore of *Botrydium*, probably a hypnocyst, is universally distributed in the mud of freshwaters in temperate regions, and also in many parts of the Tropics, since the vegetative plants almost invariably appear when such mud attains a certain degree of dryness.' (The water content of mud bearing *Botrydium* examined by the writer varied between 68·4% and 74% of the dry weight.)

The next phase marks the advent of Phanerogamic seedlings, and occasionally of *Riccia crystallina*. It will be recalled that Stahl found *Oedocladium protonema* (Pringsh. Jahrb. f. wiss. Bot., XXXIII., 1891) on damp mud, and *Oedocladium albemarlene* was found by Lewis in the same type of habitat ('Tuffs. Coll. Stud., pp. 71-72, 1918). That such rare algæ occur here, as well as rare Phanerogams (c.f., below), is a point of interest, but the fact of chief importance is that both the American and Continental species of this genus were found associated with *Riccia*, *Vaucheria* and *Botrydium*. It is therefore not unreasonable to hope that *Oedocladium* may yet be found in Britain.

Although the three genera just mentioned mark separate phases in the succession, when they occur as dominants, it is, of course, not unusual to find them intermingled.

As regards the Phanerogamic successors to the cryptogamic pioneers, the appended lists show that there is considerable variation, but the outstanding feature is the presence in great abundance of species normally regarded as rare or even very rare. These are for the most part annuals, and consequently dependent upon favourable conditions for germination in order to colonise the mud. Among the more noteworthy of these may be cited *Limosella aquatica*, *Rumex limosus* and *Alopecurus fulvus*. The last named is stated in the Floras to be a perennial, on what authority I have been unable to ascertain. Its erratic occurrence does not harmonize with this view, and Watson, who grew the species for six years in his garden, definitely states that it behaved as an annual, though, obsessed by the current belief, he adds, 'perhaps because growing on dry ground' (C. C. Watson, *Top. Bot.*, Vol. III., p. 162). Whilst it would be rash to deny that *A. fulvus* ever behaves as a perennial, it is certainly often, if not invariably, annual in its natural habitat. Both at Tring and Elstree this species was found in some plenty on the drying mud. Though apparently not there in the years immediately preceeding, it was found growing plentifully by Coleman prior to 1863. It has been similarly recorded as abundant at Ruislip Reservoir, though unknown there previous to its appearance in quantity.

A similar history attaches to *Limosella aquatica*. First recorded in Hertfordshire by Coleman in 1846 at Elstree Reservoir, it was again found in a drying pond in 1856, and a period of 61 years elapsed before it was once more met with by the writer at Little Tring. Here it was unknown previously, but yet occurred in such quantity as to give a lawn-like appearance to the mud which it covered. Only once has it been seen by the writer growing submerged, and that was due to a sudden rise in the water-level after the plants had become established.

The third species of importance is *Rumex limosus*. Like the preceding, a rare British plant, yet in 1919 it was the dominant plant on a zone some 6-8 feet wide, encircling the whole periphery of the Eastern position of the Welsh Harp, besides being scattered over the central area amongst other species. In this same year Mr. Carleton Rea recorded a similarly sudden appearance in quantity of the very rare *Elatine hydropiper*, on exposed mud near Droitwich (c.f., *Journ. Bot.*, p. 323, 1919).

Other data might be quoted, but these suffice to emphasise that we are here dealing with rare species which *suddenly appear in great profusion* under conditions that are attained during periods of drought. One knows from actual observation that a certain zone, if bare mud is exposed every year without, however, producing any effect proportional to the diminished area as compared with that during exceptionally dry seasons. This is probably due to the comparatively short period of exposure when the season is not very dry, and the liability of the narrow zone to periodic inundation. That is to say, the evidence points to the necessity for prolonged and continuous exposure.

Other common species exhibit the same phenomenon, though in their case the effect is not so striking. A good example is furnished by *Chenopodium rubrum* v. *blitoides*, which formed over 70% of the dense plant covering on the mud floor of the Welsh Harp in 1919.

As to the probable explanation. Guppy showed that the germination of some aquatic seeds may be delayed four or five years without impairing their vitality (c.f. H. B. Guppy, On the postponement of the germination of the seeds of aquatic plants, *Proc. Roy. Phys. Soc., Edinburgh*, Vol. XIII., pp. 344-359, 1894-97). Whether delay is due to mechanical pressure exerted by the seed coat, as suggested by Crocker (W. Crocker, 'Germination of Seeds of Water Plants,' *Bot. Gaz.*, Vol. XLIV., pp. 375-380, 1907, and W. Crocker and W. E. Davis, Delayed Germination in the seed of *Alisma Plantago*, *Bot. Gaz.*, Vol. LVIII. 285-321, 1914), or to lack of chemical stimulation, as suggested by Fischer (A. Fischer,

Wasserstoff und Hydroxyliovent als Keimungsreize Ber. d. Deutsch. Bot. gesellsch., Bd. XXV., pp. 108-122, 1907), is not essential to our enquiry, the fact of importance is that the retarded germination is apparently dependent on the continued immersion of the seeds, whilst germination rapidly ensues after a period of dessication.

If it be assumed that the plants above cited belong to this category, it will be found that all the observations noted above are in accord. Only in exceptionally dry years, or when for any other reason there is a prolonged and uninterrupted exposure of mud, are the seeds sufficiently dessicated to bring about germination, and it is significant that the only instances observed of these plants being submerged were the result of a rise in water level subsequent to germination.

The long period which elapses before the seedlings of *Limosella* Linn. appear on the exposed mud further supports this view; moreover, prior to the mass production of these rare species, the areas in question were sufficiently under observations of trained observers to justify the assumption that, if present at all during the years immediately preceeding, these species could only have been very sparse in their occurrence, and could not at the most liberal estimate have provided the enormous number of seeds requisite even in two or three years. The first year *Limosella* appeared at Tring, the number of plants per sq. yard was 243, so that some 142,000 at least must have been growing. (This represents the total offspring of at least 38 large plants.) The largest plants produced from 23-27 capsules. In the medium examples of these latter there were about 104 seeds, and in the largest 184.

So far attention has been directed to the annual species, but it has been shown by Crocker that *Alisma Plantago* belongs to this category of plants, and therefore it is significant that, as a consequence of the drought of 1919, large numbers of seedlings of the Water Plantain developed, and is now quite common in several ponds, where prior to 1919 it was comparatively sparse.

In a similar way such amphibious species as *Alopecurus geniculatus*, *Glyceria fluitans*, and *Polygonum amphibium* exhibited a marked increase in both amount and vigour following the dry season. Facts which emphasise the necessity for considering the incidence of dry seasons in relation to respective frequencies and the progress of the marginal succession. In peaty ponds a similar stimulating effect has been observed in the case of *Lycopodium inundatum*, *Pilularia pilulifera* and *Hypericum elodes*.

(To be continued).

PRELIMINARY LIST OF YORKSHIRE HEMIPTERA —HETEROPTERA.

W. J. FORDHAM, M.R.C.S., D.P.H., F.E.S.

WHEN the Victoria County History of Yorkshire was published, the section on Entomology did not contain any list of the Plant bugs, or Hemiptera, occurring in the County. This was probably due to the paucity of records. Since that date, however, much work has been done in the order. The writer has been able to look through a series of notes and extracts from various sources compiled by the late W. Denison Roebuck, and has also drawn to a limited degree on the stocks of records, unfortunately not very profuse, contained in various entomological periodicals, and also in the British standard works on the subject. A few of these are mentioned in the short bibliography at the end of this paper. No doubt a fuller search will reveal additional records. The bulk of the material in this list, however, is the result of recent work in the field by various Yorkshire entomologists. Foremost among these must be mentioned the late Capt. H. V. Corbett, who had compiled a preliminary list of his own captures, which he intended to publish. It was thought better to incorporate these records with the result of other work on the subject, and so to simplify the matter by publishing the Yorkshire list as a whole, and at the same time to form some sort of a tribute to the memory of one who was probably the first serious worker in the Order in the County. His father, the late H. H. Corbett, also took an interest in the Hemiptera, and his records are duly incorporated. The late J. W. Carter did some collecting in the Bradford district, and I have been able to draw on his records and also those from the Keighley district made by Mr. R. Butterfield. Other workers include Messrs. E. G. Bayford, J. M. Brown, and T. Stainforth, and the writer has been able to add his quota to the net result.

The list would not have been made possible except for the kind help of Mr. E. A. Butler, who has acted as referee, and has verified the larger proportion of species herein recorded, and has also helped with records of his own for the Whitby district. The writer has also to acknowledge much assistance from Mr. E. A. Newbery in the determination of several of his records.

The present instalment deals with the section *Heteroptera* of the order, and gives records for 196 species out of a British total of over 452 species. Much additional information on life history and habitat can be added to these records when the County list reaches a more complete state, and it is hoped

that the publication of this preliminary list will stimulate other workers to help to swell the numbers of our County Hemipterous Fauna.

HETEROPTERA.

Family PENTATOMIDAE.

- Palomena prasina* L. (*dissimilis* F.). Near Hull (Young) (4); requires confirmation.
- Piezodorus lituratus* F. Near Hull (Young) (4).
- Pentatoma rufipes* L. Melbourne, W. J. F.; Martin Beck Wood, W. J. F.; Bradford, A. R. Sanderson; Ingleton, J. W. C.
- Picromerus bidens* L. Hull, on birch, T. S.; Skipwith Common, on heather, W. J. F.; Allerthorpe Common, on *Salix repens*, W. J. F. Strensall Common and Stockton Forest, October, 1860, sucking larva of *Clostera retusa*, P. Inghald (5).
- Zicrona coerulea* L. Near Hull, J. Young (4); Allerthorpe Common, W. J. F.; Scarborough, not rare among heather in April, May and October, larvae in September, T. Wilkinson (2), (3).
- Acauthosoma haemorrhoidale* L. Near Hull, J. Young (4); Shipley Glen, Miss Leach.
- A. interstinctum* L. (*dentatum* De G.). Hull, T. S.; Skipwith Common, frequent, W. J. F.; Wheatley Wood, H. V. C., H. H. C. (6).
- Elasmotelus griseus* L. (*interstinctum* Saund). Skipwith Common, abundant, W. J. F.; Martin Beck and Wheatley Wood, H. H. C. (6).
- E. ferrugatus* F. Bradford, July, 1889, J. W. C. (*E.M.M.*, 1909, p. 197). Leeds Market, on bilberries, W. D. R. (Mr. Butterfield suggests that possibly the bilberries were Continental).

Family COREIDAE.

- Enoplops scapha* F. Near Hull, J. Young (4); Scarborough, on *Ononis*, T. Wilkinson (1), (3).
- Alydus calcaratus* L. Scarborough, T. Wilkinson (3).
- Therapha hyoscyami* L. Near Hull, J. Young (4). A handsome red and black bug requiring confirmation. It should be looked for on *Ononis* near the coast.
- Myrmus miriformis* Fall. Thorne Moor Dale (3); Wheatley Wood, H. V. C.

Family BERYTIDAE.

- Berytus clavipes* F. Near Hull, J. Young (4). Requires confirmation.
- B. signoreti* Fieb. Runswick, roots of *Ononis*, E. A. Butler.
- B. crassipes* F. Doncaster district, H. V. C.

Family LYGAEIDAE.

- Nysiusthymi* Wolff. Warrenby, near Redcar, W. J. F.
- Cymus glandicolor* Hahn. Bubwith, W. J. F.
- Ischnorhynchus geminatus* Fieb. Aislaby on *Erica*, E. A. B.
- (*Chilacis typhae* Perr. Stockton-on-Tees, in profusion in November in bulrush spikes. G. T. Rudd (1), (2), (3). This occurs also south of Yorkshire, and presumably should be found in the county).
- Rhyparochromus praetextus* H. S. Near Hull, J. Young (4). Requires confirmation.
- Macrodemia micropterum* Curt. Harden, R. B.
- Stygnocoris rusticus* Fall. Lythe, E. A. B.
- S. pedestris* Fall. Shirley Pool, Askern and Wheatley Wood, H. V. C.
- S. fuliginous* Geoff. (*arenarius* Hahn). Allerthorpe Common, W. J. F.; Thorne and Wheatley Wood, H. V. C.

- Trapezonotus arenarius* L. (*agrestis* Fall). Bubwith, Skipwith and Allerthorpe Common, W. J. F. ; Scarborough, T. W. ; Rombald's Moor, J. W. C.
- Drymus sylvaticus* F. Thorne and Wadsworth, H. V. C. ; Camblesforth, H. V. C. Common in Keighley district, 1918, R. B.
var. *Ryei* D. and S. Howden, Keighley, R. B.
- D. brunneus* Sahlb. Wheatley Wood, H. V. C.
- D. piceus* Flor. Scarborough, R. Lawson (1) ; Great Ayton, J. W. H. H. (7).
- Scolopostethus affinis* Schil. Bubwith, W. J. F. ; Wheatley Wood, H. H. C. (6).
- S. thomsoni* Rent. (*neglectus* Edw.). Wadsworth and Wheatley Wood, H. V. C.
- S. decoratus* Hahn. Bubwith, Skipwith and Allerthorpe Common, W. J. F. ; Wadsworth, H. V. C. ; Howden, Keighley, R. B.
- Gastroles ferrugineus* L. Skipwith Common, W. J. F.
- Pyrrhocoris apterus* L. Sheffield, J. M. B. ; Harrogate, Anon ; M.S. record, 1835 (W. D. R.).

Family TINGIDIDAE.

- Piesma capitata* Wolff. Bubwith, W. J. F. ; Sheffield, J. M. B.
- Acalypta brunnea* Germ. (*concinna* D. and S.). Scarborough, moss on oak trunks, winter and spring, T. W. (1), (2), (3).
- A. cervina* Germ. Runswick, in moss, E. A. B.
- Dictyonota tricornis* Schr. Runswick, E. A. B.
- D. strichnocera* Fieb. Escrick, W. J. F.
- Derephysia foliacea* Fall. Lythe, E. A. B.
- Monanthia ampliata* Fieb. Thorne, H. V. C.
- M. Cardui* L. Lythe, E. A. B.
- M. ciliata* Fieb. Scarborough, R. L. (1).

Family ARADIDAE.

- Aradus depressus* F. Thorne and Wheatley Woods, H. V. C.
- A. lawsoni* Saund. One specimen without locality in Lawson's collection (1) (in all probability from Scarborough, W. D. R.)

Family GERRIDAE.

- Hydrometra stagnorum* L. Near Hull, J. Young (4) ; Balby brickfields and Sandal, H. V. C.
- Microvelia pygmaea* Duf. Sandal brickfields, on duckweed, H. V. C. ; Austwick, A. R. Sanderson.
- Velia currens* F. Near Hull, J. Young (4) ; Allerthorpe, W. J. F. ; Filey, W. J. F. ; Ecclesall Woods, Sheffield, J. M. B. ; Sandal Beat and Bentley Ings, H. V. C. ; Keighley to Malham, R. B. ; Ilkley, Dent, Buckden, Austwick, W. J. F. ; Askham Bryan, A. Wright (*London's Mag. Nat. Hist.*) ; Teesdale, near High Force, J. E. M. (8) ; Saltaire and Eldwick, J. W. C.
- Gerris najas* De G. Walton Hall, B. Morley. Dominant species in Leeds and Liverpool Canal, at Keighley, 1918, R. B.
- G. lateralis* Schum. Keighley Moors, R. B.
var. *costae* H. S. Barden and near Skipton, R. B. ; Malham Moor, J. W. C. ; Bishopdale, W. J. F.
- G. thoracicus* Schum. Sheffield, J. M. B. ; Baildon Moor, J. W. C.
- G. gibbifer* Schum. Seamer Moor, W. J. F. ; Sheffield, J. M. B. ; Horsforth, W. D. R. ; Bingley, R. B.
- G. lacustris* L. Kilham and Sandal brickfields, H. V. C.
- G. odontogaster* Zett. Sandal brickfields, H. V. C. ; Austwick, W. J. F.

Family REDUVIDAE.

- Ploiariola vagabunda* L. Lythe, E. A. B.
P. culciformis De G. Lavingham, T. A. Marshall (1).
Nabis major Cost. Hangman Stones, Wadsworth and Loversall Carr, H. V. C. Keighley, R. B.
N. flavomarginatus Schotz. Bubwith and Skipwith, W. J. F.; Kilham, Shirley Pool and Wheatley Wood, H. V. C.; Keighley, R. B.; Askham Bog, W. J. F.; Austwick Moss, W. J. F.; Ruswarp and Staintondale, W. J. F.
N. limbatus Dahlb. Bubwith, W. J. F.; Brockodale, Tweenwoods, Wadsworth, Shirley Pool, Edlington Wood, Rossington Bridge and Mexbrough Ings, H. V. C.; Lonsdale, W. J. F.; Wharnccliffe, J. M. B.; Bingley and Keighley, R. B.; Austwick, W. J. F.
N. ferus L. Wheatley Wood, H. V. C.
N. rugosus L. Wheatley Wood, H. V. C.
N. ericetorum Scholtz. Rossington Golf Links and Edlington Wood, H. V. C.

Family SALDIDAE.

- Salda littoralis* L. Bubwith, W. J. F.; Teesmouth, W. J. F.; Eshton Tarn, R. B.
S. oculata Müll (*Morio* D. and S. Saund.). Scarborough, R. L. (1), (2), (3). (See also *E.M.M.*, 1866, p. 13, and 1895, p. 236.)
S. scotica Curt. (*riparia* D. and S.). Teesdale, near High Force, J. E. M. (8); Lavingham, T. A. Marshall (1); Thoraby, G. B. Ryle.
S. orthochila Fieb. Loversal and Wheatley Wood, H. V. C.
S. saltatoria L. Bubwith and Skipwith Common, W. J. F.; Bolton Abbey and Buckden, W. J. F.; Wensleydale, G. B. Ryle.
S. C. album Fieb. Deffer Wood, E. G. B., near High Force, J. E. M. (8).
S. pilosella Thoms. Buckden Ghyll, W. J. F.
S. pallipes F. Ferriby, T. V. Wollaston (3).
S. cincta H. S. Bubwith, W. J. F.; Crathorne, near Yarm, W. J. F.; Loversal, Thorne and Wheatley Wood, H. V. C.; Eshton, R. B.
S. cocksi Curt. Ughorpe Moor, *sphagnum*, E. A. B.

Family CIMICIDAE.

- Ceratocombus coleoptratus* Zett. Skipwith Common, W. J. F.; York, A. Beaumont (1).
Cryptostemma alienum H. S. Scarborough (2).
Cimex lectularius L. Bubwith, W. J. F.; Doncaster, H. V. C.; Sheffield W. J. F.; Leeds, in printing office, among paper, devoid of smell, W. D. R.
C. columbarius Jen. Leeds (dovecotes near), H. Denny, *Monog. Anoplur. Brit.*, 1842, p. 173.
Lyctocoris campestris F. Ellerby Moor, E. A. B.
Piezostethus galactinus Fieb. Middlesbrough, J. W. H. H. (7).
Anthocoris confusus Rent. Escrick, W. J. F.; Wheatley Wood and Rossington Bridge, H. V. C.; Wharnccliffe and Ecclesall Wood, J. M. B.; Nunthorpe, W. J. F.
A. nemoralis F. Bubwith, W. J. F.; Coxwold, W. J. F.; Thorne Moor, H. V. C.; near High Force, J. E. M. (8).
A. gallarum-ulmi D. G. Bubwith, W. J. F.
A. nemorum L. (*sylvestris* F.). Bubwith and district, abundant, W. J. F.; Cusworth, Wheatley, Norton and Sprotborough, H. V. C.; Upper Airedale, common, R. B.; Ecclesall and Wharnccliffe Woods, J. M. B.; Nunthorpe, W. J. F.; Austwick, W. J. F.; Dent, W. J. F.; near High Force, J. E. M. (8).
Tetraphleps vittata Fieb. Ecclesall Wood, J. M. B.

(To be continued).

MIDGE-GALLS OF YORKSHIRE.

RICHARD S. BAGNALL, F.R.S.E., F.L.S. AND J. W. H. HARRISON,
D.SC., F.R.S.E.

FOR the past few years we have devoted a considerable portion of our leisure to the study of the Zooecidia of the British Isles, during the course of which numerous expeditions were made into various Yorkshire localities. Temporarily, however, our work in that county has come to an end, so that we deem this a suitable time for putting on record the results of those journeys as far as the *Cecidomyiidae* or Gall-midges are concerned; our observations on the Eriophyid mites will afford material for a subsequent paper.

Group LASIOPTERARIAE.

- Clinorrhyncha chrysanthemi* H. Loew. Sparingly on achenes of *Matricaria inodora* and *Anthemis cotula*. Middlesbrough district.
C. millefolii Wachtl. Feeds on *Achillea Millefolium* and *A. Ptarmica* achenes. Very rare, Eston, Ayton.
Trotteria umbelliferarum Kieff. On *Anthriscus*. Rare, Gunnergate.
Lasioptera rubi Heeger. Affects stems of various *Rubi*. Nunthorpe, Saltburn, Scarborough; not common.

Group OLIGOTROPHARIAE.

- Misopatha ptarmicae* Vallot. On both species of *Achillea*. Not common; Middlesbrough area.
M. syngenesiae H. Loew. On *Anthemis* and *Matricaria*. Waste places, edges of fields; fairly well distributed.
Rhopalomyia millefolii Mchl. On yarrow, Redcar.
Oligotrophus bursarius Bremi. Galls leaves of *Glechoma hederacea*. Generally distributed.
O. fagineus Kieff. Forms a parenchymatous gall on beech leaves. Not common; Leeds.
O. juniperinus (L.). On juniper, near High Force.
O. hartigi Lieb. Similar to *O. fagineus*, but on various species of *Tilia*. Gunnergate, Leeds; rather rare.
O. reaumurianus F. Loew. Forms a neat gall on leaves of *Tilia*. Rare; Gunnergate.
O. tympanifex Kieff. Somewhat like *O. fagineus*, but on hazel. Guisborough, Eston, Ayton, Saltburn, etc.
O. ulmi Kieff. Also parenchymatous. On *Ulmus campestris* and *U. montana*. Plentiful where there are old elms.
Schmidtella gemmarum Rüb. On juniper, near High Force.
Mikomyia coryli Kieff. On hazel leaves. Well distributed but far from common.
Semudobia betulæ Winn. Affects fruit of *Betula*. Common, but local. Eston, Lonsdale, Kildale.
Iteomyia capreae Winn. Leaves of *Salices* of the *Caprea* group. Practically everywhere.
I. major Kieff. Somewhat like *I. capreae*, but rarer. At present only from *Salix aurita* and *S. cinerea*. Redcar, Great Ayton Moor.
Janetiella lemeei Kieff. Forms a characteristic gall on midrib and nerves of elms in June. Local, but very abundant where it does occur. Bardsey, near Leeds.
Mayetiola avenae Marchal. Galls stems of *Avena*. Very rare; Nunthorpe.

- Mayetiola ventricola* Rübs. On *Molinia caerulea*. On all the Cleveland Moors.
- Chortomyia hellwigi* Rübs. Gallling stems of *Brachypodium sylvaticum*. Leeds district.
- Cystiphora pilosellae* Kieff. On leaves of *Hieracium Pilosella*. Rare ; Redcar.
- C. taraxaci* Kieff. On leaves of dandelion. Very local ; Redcar.
- Macrolabis corrugans* F. Loew. Distorts leaves of *Heracleum Sphondylium*. Common and widespread.
- M. lamii* Rübs. Similar to the preceding, but on *Lamium album* ; here first definitely recorded from the British Isles. Gunnergate.
- M. luceti* K. First British record. Sparingly on *Rosa glauca* forms in the North Cleveland area.
- M. pilosellae* Binnie. On *Hieracium Pilosella*. Redcar.
- Arnoldia* sp. In the mass of young leaves near the growing point of oak shoots ; prefers young trees. Common everywhere.
- Rhabdophaga albipennis* H. Loew. Galls bark of *Salices*, preferring those of the *S. alba* group ; gall very inconspicuous. Very common everywhere.
- R. marginemtorquens* Winn. Folds margin of leaves of *Salices* chiefly *S. alba* group. Abundant everywhere.
- R. nervorum* Kieff. Galls nerves of various *Salices*. Abundant on *S. vitellina*, Nunthorpe.
- R. rosaria* H. Loew. Forming a persistent rosette of leaves on various willows and willows. Generally plentiful.
- R. rosariella* Kieff. On *Salices* of the *Caprea* group ; similar to the last named species, but smaller. Great Ayton.
- R. saliciperda* Dufour. On various *Salices*. Eston.
- R. terminalis* H. Loew. Likewise on *Salices*. Everywhere abundant, even in Middlesbrough.
- Perrisia abietiperda* Hens. On *Picea excelsa*. In Marton Gill.
- P. acrophila* Winn. On *Fraxinus excelsior*. Thinly, but well distributed.
- P. affinis* Kieff. On *Viola* spp. Stainton, Yarm, Ayton, etc.
- P. angelicae* Rübs. Swollen florets of *Angelica sylvestris*. Very abundant in Durham and probably elsewhere ; here first recorded from Britain. Yorkshire ; quite common, Great Ayton.
- P. aucupariae* Kieff. Twists leaves of *Pyrus Aucuparia*. Lonsdale, Kildale.
- P. auritae* Rübs. Folds leaves of *Salix aurita* and *S. cinerea* like *R. marginemtorquens* ; here first recorded from the British Isles. On *Salix aurita*, Lonsdale.
- P. brunellae* Kieff. On *Prunella vulgaris*. Stainton ; rare.
- P. cirsii* Rübs. In heads of common thistle. Widespread and common.
- P. compositarum* Kieff. On heads of *Cirsium lanceolatum*. Marton, Bardsey, near Leeds.
- Perrisia* sp. On *C. lanceolatum* ; larvæ whitish. Not uncommon.
- P. corylina* Kieff. In hazel catkins. Guisborough Park Wood.
- P. crataegi* Winn. Terminal rosette of leaves on *Crataegus oxyacantha*. Everywhere excessively common.
- P. daphnes* Kieff. On *Daphne Laureola*. Gunnergate.
- P. engstfeldi* Rübs. On *Spiraea Ulmaria*. Marton, Ayton.
- P. ericina* F. Loew. On *Erica cinerea* ; Great Ayton Moor.
- P. filicina* Kieff. On *Pteris aquilina*. Not very common, but still well distributed.
- P. fraxinea* Kieff. On leaves of ash. Not uncommon in the Cleveland area.
- P. fraxini* Kieff. With the preceding species.
- P. fructuum* Rübs. In seed pods of the members of the genus *Cerastium*. Plentiful everywhere in the Cleveland District.

- Perrisia geranii* Kieff. Almost certainly this is an 'aggregate' species requiring careful study for its final elucidation. Redcar, on *Erodium*; Middlesbrough, on *Geranium sylvaticum*; Redcar, on *G. molle*.
- P. hygrophila* Mik. On *Galium palustre*. Nunthorpe, Leeds District; probably generally distributed.
- P. inchoaldiana* Mik. On *Salix alba*. Fairly general.
- P. kiefferi* Marchal. On ivy flowers. Middlesbrough and Gunnergate.
- P. laricis* F. Loew. On *Larix decidua*. Eston and Kildale.
- P. lathyri* Kieff. On *Lathyrus pratensis*. General.
- Perrisia* sp. Houard, 3776. With *P. lathyri*.
- P. libera* Kieff. On oak. Thinly but widely distributed in the Cleveland, and Leeds district.
- P. loewiana* Rüb. On *Vicia sepium*. Not uncommon.
- P. lotharingiae* Kieff. On *Cerastium*; Redcar.
- P. loticola* Rüb. On *Lotus corniculatus* and *L. major*. Not uncommon in the Northern Cleveland.
- P. malpighii* Kieff. On *Quercus*. Near Leeds.
- P. miki* Kieff. On *Centaurea nigra* and *C. scabiosa*. Marton.
- P. panteli* Kieff. On oak. Common on one tree near Leeds.
- P. periclymeni* Rüb. On *Lonicera Periclymenum*. Great Ayton, Yarm, Bardsey.
- P. plicatrix* H. Loew. On crinkled leaves of various species of *Rubus*. Not uncommon, everywhere.
- P. pustulans* Rüb. On *Spiraea Ulmaria*; not rare. In all old colonies of meadow sweet near Middlesbrough.
- P. ranunculi* Bremi. On leaves of various *Ranunculi*, chiefly *R. repens*. Generally not uncommon.
- P. rhododendri* Kieff. In the garden of our friend Lofthouse at Middlesbrough, on *Rhododendron ferrugineum*.
- P. rosarum* Hardy. In folded leaves of all wild roses; everywhere common, but preferring *Rosa glauca* forms.
- P. rostrupiana* Kieff. On *Spiraea Ulmaria*. Rare near Middlesbrough.
- P. serotina* Winn. On *Hypericum* near Leeds.
- P. silvicola* Kieff. On *Stellaria Holostea*, near Leeds.
- P. spadicea* Rüb. On *Vicia sepium*, not uncommon.
- P. stachydis* Bremi. On *Stachys sylvatica* and *S. palustris*. Not rare in the Cleveland.
- P. thomasiana* Kieff. On several species of lime. Gunnergate.
- P. tortrix* F. Loew. On plum and blackthorn. Near Leeds.
- P. trifolii* F. Loew. On *Trifolium* spp. Everywhere; only needs careful searching.
- P. tubicola* Kieff. On *Cytisus scoparius*. On disused railway near Normanby.
- P. ulicis* Kieff. On *Ulex europaeus*. Eston.
- P. ulmariae* Bremi. On *Spiraea Ulmaria*. Common everywhere.
- P. ulmicola* Kieff. On *Ulmus*. Leeds district.
- P. urticae* Perris. On *Urtica dioica* and *U. urens*. Exceedingly common everywhere.
- P. veronicae* Vallot. Generally on *Veronica Chamaedrys* and *V. montana*; rarely on other *Veronicae*. Plentiful.
- P. viciae* Kieff. On *V. cracca*, etc. Abundant.
- Perrisia* sp. In heads of *Solidago*. Not rare.
- Jaapiella volvens* Rüb. On *Lathyrus pratensis*. Not uncommon.
- J. cirsiicola* Rüb. On flowers of *Cirsium arvense*. Fairly general.
- Hartigiola annulipes* Hartig. Forms a characteristic gall on beech leaves. Not very common, but still widespread.
- Taxomyia taxi* Inchoald. On Yew. Rare in the North; Gunnergate.

Group ASPHONDYLARIAE.

- Schizomyia galiorum* Kieff. On various *Galium* spp., especially *Galium verum*. Redcar, Saltburn, etc.
S. tami K. On *Tamus communis*. From South Durham, southwards.
S. ligustri Rübs. Galls flowers of privet. Once only, Hemlington.
Asphondylia mayeri Lieb. On *Cytisus scoparius*. Normanby, Lonsdale.
A. sarothamni H. Loew. With the last named.
A. ulicis Verral. On *Ulex europaeus*. Abundant everywhere.

Group BRACHYNEURARIAE.

- Mikiola fagi* Hartig. On leaves of beech. Marton Gill.

Group CECIDOMYIARIAE.

- Monarthropalpus buxi* Geoffroy. On box, Nunthorpe.
Anabremia bellevoeyi Kieff. On *Lathyrus pratensis*. Not uncommon in the Cleveland area.
Contarinia anthobia F. Loew. On hawthorn flowers. Common everywhere in the Middlesbrough district.
C. barbichei Kieff. On *Lotus corniculatus*. Common enough everywhere.
C. betulicola Kieff. On *Betula alba*, Eston.
C. betulina Kieff. Likewise on *Betula alba*. Eston, Ayton, Kildale, Leeds area.
C. coryli Kieff. On Hazel, near Leeds.
C. cracca Kieff. On *Vicia cracca* and *V. sepium*. Common enough.
C. floriperda Rübs. On flowers of *Pyrus Aucuparia* and *P. Aria*. Everywhere on the former, but only Middlesbrough Park on *P. Aria*.
C. helianthemii Hardy. On *Helianthemum vulgare*. Saltburn.
C. nicolayi Rübs. On flowers of *Heracleum Sphondylium*. Redcar, Ayton, etc. Varies in abundance.
C. quercina Rübs. On oak. Bardsey, near Leeds.
C. sorbi Kieff. On *Pyrus Aucuparia*. Quite common, Great Ayton Moor, Lonsdale, Kildale.
Contarinia sp. On flowers of *Pyrus torminalis*. Middlesbrough Park.
C. steini Karsch. On flowers of *Lychnis alba* and *L. dioica*. Sparingly, but generally distributed.
C. tiliarum Kieff. On various species of *Tilia*. Usually very common, but quite rare in the Cleveland area.
C. viburnorum K. On guelder rose, Thirsk.
C. tragopogonis Kieff. On *Tragopogon pratensis*. Redcar.
Syndiplosis lonicerae F. Loew. On guelder rose, Thirsk.
Stictodiplosis corylina F. Loew. On *Corylus Avellana*. Bardsey, near Leeds.
S. hypochoeridis Rübs. On flowers of *Crepis biennis*. Stainton.
S. jacobaeae H. Loew. On *Senecio Jacobaea*. Middlesbrough district.
Myricomyia mediterranea F. Loew. On *Erica Tetralix*. Eston and Ayton Moors.
Macrodiplosis dryobia F. Loew. On oak. Generally distributed, but not very common.
M. volvens Kieff. Like the preceding and occurring with it.
Xenodiplosis laeviusculi Rübs. On the gall of *Neuroterus laeviusculus* on oak. Bardsey, near Leeds.
Parallelodiplosis galliperda F. Loew. On gal of *Neuroterus lenticularis* on oak. Nunthorpe.
Harmandia pustulans Kieff. On *Populus tremula*. Nunthorpe, very rare.
Clinodiplosis liorrhizae K. Inquiline in galls of *Teras terminalis*. Not uncommon.
C. botularia Winn. Inquiline in galls of *Perrisia fraxini*. Bardsey and Gunnergate.

Mycodiplosis sp. Feeding on *Puccinia suaveolens* on common thistle. Not rare near Middlesbrough.

Massalongia rubra Kieff. On midrib and nerves of *Betula* leaves. Common enough in birch woods in the Cleveland.

Group PORRICONDYLARIAE.

Dirhiza rhodophila Hardy. Like *Perrisia rosarum*; larvæ white. Great Ayton.

Species at present without names.

Cecidomyidarum sp. Gallling acorns of several oak species and preventing their development. Easby, Kildale, Lonsdale.

C. sp. On fruit and flowers of *Atriplex patula*. Redcar.

C. sp. On *Achillea Ptarmica* near Leeds. The only known examples.

[We have not listed species noted by other authors, most of which are very common, nor have we elaborated a long list of *Cecidomyidarum* spp.]

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The Geological Society of London has issued its *Abstracts of Proceedings*, Nos. 1059-1074 (III pp., 6/-.)

A report on the Society's Long Excursion to the Lake District, by J. F. N. Green, and a paper on The Geology of Jersey, by G. H. Plymen, are among the contents of the *Proceedings of the Geologists' Association*, Vol. XXXII., Pt. 3.

Among the contents of the *Proceedings of the Society of Antiquaries of London*, Vol. XXXII., just published, is Sir Hercules Read's Presidential Address to the Society, and a suggestive paper on 'The Chronology of Flint Daggers,' in which many East Yorkshire examples are figured, by Reginald Smith.

The *Caradoc and Severn Valley Field Club* has published its *Record of Bare Facts* for 1920 (45 pp). In this compact form the Club places on record a wealth of information on the various aspects of the fauna and flora of its area; there are also valuable meteorological reports. The record is well edited and well produced.

Besides a lengthy report on the Birds of Epping Forest, and a paper on Birds in Andalusia, by H. K. Swann, and reports on Archaeology, Botany, Lepidoptera, Birds and Plant Galls, the *Transactions of the London Natural History Society* for 1920 (42 pp., 3/-), contains details of the Society's work during the year. The record is a good one.

Among the contents of *The Journal of the Ministry of Agriculture* for August are: 'The Effect of Chalk on the Cultivation of Heavy Land,' by E. J. Russell and B. A. Keen; 'Besom Making in Derbyshire and Nottinghamshire,' by H. FitzRandolph; 'The Grey Field Slug,' by H. W. Miles; and 'Eradicating Gall Mite from Black Currant Stocks,' by H. Goude.

We see from *The Proceedings of the Linnean Society* (p. 21) that 'On December 12th, 1817, Mr. Koenig recommended the Trustees (of the British Museum) to purchase the pioneer geological collection of William Smith, and assured them that he had discussed the subject with Sir Joseph Banks, and availed himself of Sir Joseph's superior insight into these matters.'

The Fiftieth Annual Report of the Bradford Libraries, Art Gallery and Museum Committee contains a record of the popularity of the Bolling Hall Museum, the Cartwright Memorial Hall and the Natural History Museum. The frontispiece represents an oak cupboard which is said to have stood 'for centuries' in an old farmhouse near Hebden Bridge, though the date upon it, even if genuine, shows that it is less than three centuries old.

CORRESPONDENCE.

DAMAGE BY WILD RABBITS AND HARES.

Referring to Mr. Wattam's note (*The Naturalist*, Sept., p. 318), may I warn those with gardens that rabbits and hares are very fond of the bark of young pear and apple trees, and, to a lesser extent, that of plum and damson. If the bark is gnawed all round the trees, they die.—FREDERICK D. WELCH.

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PICTURE HOUSES AND BIRD LIFE.

It almost seems to have become necessary that naturalists as a body should protest against the absurd statements flashed upon the screen in the picture houses of the country. Many of them are ridiculous and absurd, and some, like the following sample, cruelly libellous. A picture of the Lapwing was being shown and amongst other absurd statements this appeared: 'Its habits are abominably dirty, it feeds on filth!'—R. F.

—: O :—

PROTECTION FROM FLIES.

All field workers know what a nuisance ordinary flies can be at this time of year, but it does not seem to be generally known that one can get almost perfect protection by distributing about a tablespoon of paraffin (kerosine) on the brim of one's hat or on one's head. For midges it is no good.—A. E. BOYCOTT.

An excellent mixture for this purpose was referred to in these columns some time ago. It was known as 'Terrify,' and was prepared by Mr. W. Mansbridge, of the Lancashire and Cheshire Entomological Society.—ED.

——: O :——

North England: An Economic Geography, by L. Rodwell Jones. London: G. Routledge & Sons, 256 pp., 6/- net. The author has produced a fascinating book on new lines, and one that will well repay perusal by naturalists or teachers. His theme is the physical environments which have influenced the evolution of some of our greatest industries. He emphasises the dynamic factors in the localisation of industries. He has made a careful series of sketch-maps which admirably illustrate his points. There are a few slight typographical errors which may be corrected in the next edition; the collieries are not the only things scattered in 'scattered collieries' (p. 21), and the I. Sheppard (p. 117) is neither Isaac nor Jack!

The Rebuilding of Britain: Causes and Effects of the Great War, by an Inspector of Schools. A Brown & Sons, 141 pp., 2/6 net. This is hardly a natural history publication, but it is issued by the publishers of *The Naturalist*. It is a fine summary of the causes leading up to the great war, and we agree that it would be a great advantage if it were read by every British child. In some parts of the book the child is obviously being addressed direct: in others the inspector is evidently talking to the teachers about the children. This sometimes occurs in adjoining paragraphs (p. 5). As to whether the 'matters treated of are too "obstruse," too "dry"' to be acceptable, *that will depend entirely on the skill of the teacher!* who presumably must accept this verdict without criticising the anonymous inspector. There are portraits of King Edward VII., Emir Feisal, Zeppelin, Borden, Jellicoe, Asquith, Chamberlain, Tirpitz, Captain Fryatt, and many others, a view of a Dairyman's home in Australia, a Canadian river full of logs, a sheep farm, etc., all presumably more or less connected with the story.

KEY TO THE HARPIDIROID HYPNA.

J. A. WHELDON.

(Continued from page 248).

(E) DREPANOCLADUS (C. Mull. pp) Loeske.

Stems without paraphyllia, tomentum or dilated cortical cells. Branches typically pinnate. Leaves typically falcate-secund, epapillose, singly nerved, nerve usually long, but in a few forms not exceeding mid-leaf, margins entire, cells linear, laxer towards leaf-base, with cells more or less differentiated, forming distinct auricles. Capsule annulate. Inflorescence dioicous.

1. Nerve very strong, distinctly excurrent (2). Nerve not excurrent (7).

2. Leaves not sulcate (3). Leaves distinctly sulcate when dry (*D. Barbeyi*).

3. Stems regularly pinnate, robust: leaves 3×1 mm. or more (4). Stems irregularly branched (5).

4. Leaves falcate-secund: stems and branches falcate at apices (*D. capillifolius* var. *falcatus*). Leaves more or less squarrose: at apices erect patent or feebly secund (*D. capillifolius* var. *squarrosus*).

5. Robust: leaves large, 4-7 mm. long (6). Slender, elongate (15 cm.) subsimple or slightly branched: leaves small, lanceolate, erect patent (*D. capillifolius* var. *gracilescens*).

6. Tall (up to 30 cm.), lower branches elongate and stem-like (8 cm.): leaves erect patent, upper secund (7×1 mm.), median cells 15 times as long as broad (*D. capillifolius* var. *laxifolius*). Shorter (5-10 cm.), denuded below: stem and branch leaves nearly uniform ($5 \times .5$ mm.): lamina cells 16-25 times as long as broad (*D. capillifolius* var. *angustifolius*).

7. Greenish-yellow to golden or brown: basal cells more or less porose: alar cells relatively small and thick-walled, forming small rounded projecting distinct yellowish to brownish auricles, or auricles nearly obsolete (8). Yellowish-green to deep green: basal cells scarcely porose: alar cells usually laxer, forming widely triangular more or less decurrent auricles (19).

8. Auricles very small, not very distinctly defined, or nearly obsolete (9). Auricles distinct (17).

9. Leaves small ($1.25 \times .7-1$ mm.), more shortly acuminate, not rugose: nerve simple or forked (10). Robust: leaves large ($3-6 \times 1.3-1.5$ mm.): nerve simple, reaching base of the longer slender acumen: leaves lightly striate and subrugose when dry (12).

10. Nerve simple brownish-purple (65μ wide), entering acumen: leaves ($1.5-2$ mm.): habit of *L. intermedia* (*D. Flageyi*). Nerve often forked, reaching little more than mid-leaf (11).

11. Stem leaves ovate-lanceolate, acuminate: habit of a small *D. Sendtneri* (*D. brevifolius*). Stem leaves widely ovate suddenly apiculate-acuminate: habit of a slender *S. scorpioides* (*D. latifolius*).

12. Stems irregularly branched, leaves concave, with a relatively slender nerve, 40-70 μ wide (13). Stems densely pinnately branched, the pinnæ incurved: nerve 80 μ wide (*D. lycopodioides* var. *americanus*).

13. Slender and scarcely turgid (14). Robust and more or less turgid (15).

14. Elongate, leaves distant and rather narrower and with longer acumen than the type falcate-secund, resembling a very robust *D. Sendtneri* (*D. lycopodioides* f. *attenuata*). Shorter: leaves closely and julaceously appressed, the stem apices acute and slightly curved (*D. lycopodioides* var. *julaceus*).

15. Moderately stout, frequently elongate (16). Short and obese, very densely leaved, leaves large and wide (*D. lycopodioides* f. *obesus*).

16. With many flagelliform innovations, the slender shoots resembling *D. aduncus* (*D. lycopodioides* f. *proliferus*). Without flagelliform shoots, branches resembling stems, but more slender (*D. lycopodioides*).

17. Leaves acuminate, nerved $\frac{3}{4}$ or to base of acumen : auricles nearly reaching nerve, of more elongate rectangular cells (*D. aquaticus* var. *occidentalis*). Leaves subulate, nerve longer, ceasing in acumen (except in *D. asturicus*) : a wide space between nerve and alar cells, the latter shorter, less decurrent : nerve 40-70 μ wide (18).

18. Very robust and regularly pinnate : leaves large, with a long subule, very regularly circinate, crowded (*D. Wilsoni* var. *hamatus*). Less robust, more irregularly branched : leaves somewhat laxer, smaller, more flexuose and with a shorter subule (*D. Wilsoni*).

19. Nerve very strong, 40 to 120 μ wide (20). Nerve more slender 30 to 60 μ wide : if wider, auricles reaching nerve (27).

20. Leaves distant, spreading from a broad base gradually narrowed into a widely acuminate plane recurved acumen : stems (20 cm. high) plumosely pinnate : nerve reaching beyond middle 70-80 μ wide : basal cells somewhat incrassate (*D. asturicus*). Leaves falcate to circinate-secund, with a long channelled subule, in which the nerve is more or less engaged (21).

21. Very slender, almost filiform : leaves from a short ovate triangular base, suddenly narrowed to the reflexed subulate points : cells shorter, basal about 3-4 times as long as broad : nerve up to 70 μ wide (*D. Sendtneri* var. *gracilescens*). More robust : leaf base longer and acumen more prolonged : cells 8-24 times as long as broad (22).

22. Leaves small, 1.5-2.5 mm. long : rather densely tufted (23). Leaves longer, 2.5-4 mm. long : more loosely caespitose (24).

23. Much branched and rather rigid : leaves rather sudden acuminate-subulate, strongly falcate to circinate (*D. Sendtneri* f. *vulgaris*). Softer, branches short : leaves longly and gradually subulate, lightly appressed, the points falcate-secund : although the leaves are as long as in the preceding, the stems look slender and less turgid, owing to the straighter more appressed leaves (*D. Sendtneri* f. *tenuis*).

24. Very robust and stately (15-40 cm.) : branches long, often pinnate and stem-like median cells very long, 70-120 μ (25). Not so stout, shorter, 10-20 cm. : median cells shorter, 50-80 μ (26).

25. Leaves distant, slightly falcate, from an oval oblong base, gradually narrowed to a long flexuose twisted subule : median cells 80-90 μ long : nerve 70-100 μ wide (*D. Sendtneri* var. *trivialis*). Leaves strongly falcate-secund, large, with very long setaceous-subulate points : auricles very small, decurrent : nerve 90-120 μ wide at base : cells long and prosenchymatous to leaf base (median 110 μ long) : plant dark green, almost black below (*D. Sendtneri* var. *giganteum*).

26. Auricles occupying $\frac{1}{2}$ or less of the distance to the nerve (*D. Sendtneri*). Auricles wider, occupying about $\frac{1}{2}$ the distance to the nerve (*D. Sendtneri* f. *late-auriculata*).

27. Median cells very long, 60-80 μ : alar cells occupying all or nearly all the leaf base : nerve rather stout, 50-80 μ wide, reaching above half way or entering base of acumen (28). Median cells shorter, 20-60 μ : nerve weaker, shorter : alar cells occupying $\frac{1}{2}$ to $\frac{3}{4}$ of space between margin and nerve (36).

28. Basal sinus rather shallow and wide : leaves more or less falcate-secund above, with a long usually canaliculate subule (29). Basal sinus deep and narrow, almost orbicular through the points of the auricles approaching (32).

29. Slender and gracile (10-15 cm.) : leaves small (up to 2.5 mm. long), falcate, finely acuminate (30). Stout, with broader leaves and shorter leaf points (31).

30. Nerve 66 μ wide, median cells 66 μ long: plant short, yellowish, irregularly divided, divisions subpinnate: alar cells yellow, incrassate, obscure with granulations (*D. pseudofluitans* var. *aquaticus* f. *dunense*). Nerve stronger, very long, penetrating base of the long gradually attenuate filiform acumen: plant slender and gracile, rather densely pinnate above: 10-15 cm. (*D. pseudofluitans* var. *aquaticus* f. *tenuis*).

31. Leaves very distant, often laxly spreading below: stem elongate (to 30 c.m.) with short distant branches, resembling in habit slender forms of var. *paternum* (*D. pseudofluitans* var. *aquaticus* f. *fluitans*). Leaves closer, erect-secund below, more or less falcate above: shorter (10-15 cm.), pinnate (*D. pseudofluitans* var. *aquaticus*).

32. Robust to very robust: leaves erect patent, apical ones more closely imbricate, finely but not longly acuminate (33). Slender and flexuose: leaves narrower, flexuose and lightly homotropous, prolonged into a long fine twisted subule (*D. pseudofluitans* var. *flexilis*).

33. Regularly pinnate, branches long or short: lower leaves lax and sub-patent (35). Weaker, slender, simple or with few irregular branches (34).

34. Elongate: leaves very distant, narrower, erect flexuose, apical convolute forming a second cusp (*D. pseudofluitans* f. *gracilis*). Sub-simple or irregularly divided, leaves more or less imbricate, so that upper half of stems and branches are julaceous and pungent (*D. pseudofluitans* f. *acanthoclada*).

35. Stems eflagellate, more or less regularly pinnate (*D. pseudofluitans* var. *paternum*). Stems pinnate below, ending above in a long flagellate often branchless shoot, and also often bearing below numerous long filiform distant-leaved innovations (*D. pseudofluitans* var. *paternum* f. *flagelliformis*).

36. Leaves acuminate subulate, acumen concave at base and usually more or less falcate secund: alar cells distant from nerve (37). Leaves not, or only slightly, falcate-secund, acumen plane: plant usually more robust: alar cells less distinctly separated and sometimes reaching to nerve (49).

37. Leaves under 2 mm. long, rather brusquely acuminate from a subdeltoid base (38). Leaves larger, 2-4 mm. long, more gradually narrowed from an ovate to oblong-lanceolate base (42).

38. Leaves falcate-secund, not apiculate (39). Leaves subfalcate-appressed, suddenly contracted into a straight fine apiculus: stems filiform, fastigiately branched (6-8 cm.): nerve 40 μ wide (*D. aduncus* var. *filipolaris*).

39. Erect, rigid, short and slender, with many short pointed branches. Leaves imbricate, lightly curved, points secund: nerved just beyond mid-leaf: nerve 35 μ : lower third of leaf parenchymatous (*D. aduncus* var. *filiforme*). Taller, also rigid, leaves more strongly falcate-secund

40. Erect, 5-12 cm. high, nerved about half way (41). Depressed interlaced and procumbent, more or less pinnate: nerve very short and sometimes rudimentary, rarely reaching mid-leaf (*D. aduncus* var. *gracilescens* f. *tenuis*).

41. Irregularly pinnately branched (*D. aduncus* var. *gracilescens*). Densely fastigiately branched, branches slender (*D. aduncus* var. *gracilescens* f. *fastigiata*).

42. Leaves erect-appressed, only lightly secund at the point: apices of stems and branches only feebly curved (*D. aduncus* var. *typicum* f. *laevis*). Leaves more or less strongly falcate-secund (43).

43. Leaves strongly dimorphous: straight leaves erect flexuose, feebly curved, lanceolate, very longly subulate (3-4 mm.): br. leaves small (1.5-2 mm.), distinctly falcate-secund (*D. aduncus* var. *Wheldoni*). Dimorphism less marked, st. or br. leaves falcate-secund (44).

44. Nerve strong (up to 53 μ): plant rather more robust (45). Nerve weaker (47 μ): plant more slender (46).

45. Acumen flexuose, longly subulate : alar cells very prominent and convex, large, hemispherical : cells 12 times as long as broad, median $72\ \mu$, upper $78\ \mu$ long (*D. aduncus* var. *cyrtopterum*). Acumen subcarinate, not flexuose : alar cells less projecting : cells a little shorter (*D. aduncus* var. *pseudo-Sendtneri*).

46. Alar cells coloured purple-brown, their walls thick, often filled with brown granulations : nerve $30-45\ \mu$: median cells $60-66\ \mu$: 8-10 times as long as wide (*D. aduncus* var. *falcatus* f. *rufoalaris*). Alar cells not rufous-brown (47).

47. Leaf base broadly ovate-lanceolate : acumen fine but hardly filiform (48). Leaf base narrower, almost lanceolate : acumen with a piliform subule : cells a little shorter, flexuose, rather dense (*D. aduncus* var. *falcatus* f. *subpiligera*).

48. Auricles hyaline (*D. aduncus* var. *falcatus*). Auricles obscure, filled with granulations and often badly delimited (*D. aduncus* var. *falcatus* f. *littoralis*).

49. Leaves rather small : median cells comparatively short and wide ($30-40\ \mu$ long) : apical leaves ovate-deltoid, shortly acuminate (50). Leaves larger : median cells longer and relatively narrower, $35-50\ \mu$ long (51).

50. Procumbent, often with many irregular slender branches : leaves lax, erect-patent, only lightly secund above (*D. polycarpus*). Submersed or in drier situations in depressed patches, very slender : branches long, almost filiform : leaves very distant, patent : habit of *Amblystegium Kochii* (*D. polycarpus* var. *attenuatus*).

51. Leaves imbricate, the upper ones julaceously appressed, with short points (52). Leaves ovate oblong to oblong-lanceolate, 2-5 mm. long : the apical ones not markedly julaceously appressed except in the apical bud (53).

52. Terete terminal portion of stem elongate cylindrical (*D. polycarpus* var. *pungens*). Terete terminal portion of stem ovate clavate (*D. polycarpus* var. *clavatus*).

53. Leaves spreading, flexuose, 2-3 mm. long, oblong, insensibly and longly acuminate subulate, subule flexuose and twisted (*D. polycarpus* var. *peracuminatus*). Leaves oval or ovate, erect patent or subsecund, not subulate (54).

54. Leaves uniform, large (5×2.5 mm.), very distant, broadly oval, loosely erect patent : plant soft and weak, nearly simple : auricles very indistinct : nerve short (*D. polycarpus* var. *immersus*). Leaves more or less distinctly dimorphous, shorter and broader upwards, ovate-acuminate (55).

55. Plant rather robust : stems regularly and often rather closely pinnate (56). Plant usually more slender, green, irregularly pinnate or branched, sometimes subsimple (57).

56. Yellowish, rather rigid, 8-15 cm. high (*D. polycarpus* var. *intermedius* f. *penna*). Pale green, elongate and slender (up to 25 cm. long) : st. leaves very distant, heterotropous : median cells up to $75\ \mu$ long, much shorter and laxer towards base : nerve about half way (*D. polycarpus* var. *intermedius* f. *inundata*).

57. Alar cells distinct : leaves distant (*D. polycarpus* var. *intermedius* f. *laxa*). Alar cells less distinct, sometimes almost obsolete : elongate and floating, leaves very distant, subfalcate, apical cusp falcate-secund (*D. polycarpus* var. *intermedius* f. *laxifolia*).

(To be continued).

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Notes on a Collection of Hepatics from the Cameroons, W. Coast of Africa, by W. H. Pearson, is the title of *Manchester Museum Publication* No. 84 (6 pp., 2/-).

YORKSHIRE NATURALISTS AT YORK.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.SC.

THE August Meeting of the Yorkshire Naturalists' Union was held at York in Bank Holiday week-end (July 30th to August 1st), when an enjoyable series of excursions was carried out. Headquarters were in York, members using the Museum grounds for this purpose in the evenings, through the kindness of the Council of the Yorkshire Philosophical Society. Dr. W. E. Collinge was in attendance, and took a personal interest in explaining the contents of the Museum to those members who were able to find time to see the collections. Representatives of most of the sections were kept well occupied in spite of the abnormally dry conditions prevailing at most of the localities visited. In addition, the meeting was favoured with almost perfect weather.

The proceedings opened with a visit to Tillmire and Heslington Common on Saturday, July 30th, and the ornithologists quickly found a subject for enquiry in the numerous pellets of grain skins found there. These were concluded to be bird castings, probably ejected by rooks. Mr. H. B. Booth, the President, also picked up the body of a little owl, which had apparently just been shot. Members met after tea in the Museum grounds, and visited the botanical gardens with much interest. Mr. Scott had kindly thrown open the observatory, and had proposed to make use of the telescope after dark, but unfortunately the night was overcast.

On July 31st Askham Bog was visited. The Bog was unusually dry underfoot, but a couple of heavy showers more than compensated for this deficiency by thoroughly wetting the undergrowth, without detracting from the pleasures of a full and interesting day.

The following day, August Bank Holiday, was spent at Skipwith, half of the members devoting themselves to the common, while the remainder visited the river. The former party found it distinctly hot, and were well content to spend a pleasant hour with the President watching the birds on a small pool.

The general meeting was held in Skipwith, after a well earned tea, the President being in the chair. Two new members were elected, and after the reports had been discussed, the proceedings closed with the carrying of votes of thanks to the landowners whose estates had been opened to the Unions' visit, and also to the members of the York Naturalists' Society, who had done so much to make the meeting a success.

ECOLOGY (W. H. Pearsall).—As was pointed out by Mr. Wroot, the superficial geology of the district is represented almost entirely by deposits of glacial origin. In the three areas visited, the most important of these is a layer of clay or clayey loam, probably deposited in temporary lakes held up by ice blocking the drainage channels. At Tillmire, and to a less extent at Skipwith, these clays are overlaid by sands which appear to have been washed into the lakes by torrential streams, the limit of one of the stream deposits being very clearly marked by a bank 6 to 10 ft. high at Tillmire. The thickness of these sandy layers appears to control, very largely, the primitive types of vegetation developed at Askham Bog, Skipwith and Tillmire.

Sand appears to be absent at Askham Bog, and the development of vegetation over an ill-drained clay, with waters moderately rich in lime, has resulted in the production of 'fen' peat, and of plant communities most closely resembling those of the East Anglian fens, and particularly those existing on Woodwalton Fen, Lord Rothschild's nature preserve. It would be of interest to know if this similarity extends to the animal communities.

On Skipwith Common there is generally a moderate depth of sand (1 to 2 ft.) overlying the basal clay. The distance of the surface above the permanent water level and the poverty of the sand in lime have

prevented the accumulation of rich fen peat, and coupled with the inefficient drainage, have led rather to the formation of a thin acid peat layer, and the ultimate development of the damp heath type of vegetation in which *Calluna*, *Erica Tetralix* and *Molinia cærulea* are locally dominant, apparently depending largely on the depth of the underlying sand. Depressions in the underlying clay, where sand is often absent, are filled with pools, round which *Juncus effusus*, *Carex elata*, *Eriophorum angustifolium* or *Hypericum elodes* may be abundant.

The rabbit warren at Tillmire offers an extreme example of the conditions found at Skipwith. Here, however, another factor, 'rabbit pressure,' has also to be considered. The vegetation is chiefly 'grass heath' dominated by *Agrostis vulgaris*, with which *Deschampsia flexuosa*, *Agrostis alba*, *Triodia decumbens*, and *Festuca ovina* are also frequent. There can be little doubt that here the development of *Calluna* heath is prevented by the grazing of rabbits and the manurial effects they produce. Similar effects have been described in detail by Farrow in Breckland (*Journ. Ecol.* IV., p. 57). Since, however, it is the depth of the sand which leads to its suitability for rabbits, the vegetation type found here must ultimately depend, to a certain extent, upon the glacial phenomena previously mentioned.

The presence of such plants as *Riccia fluitans*, *Ricciocarpus natans*, *Lemna minor*, *L. trisulca*, *Hydrocharis Morsus-Ranae* and *Hottonia palustris* in the ditches and pools at Askham Bog is probably important, since these plants are characteristic of a plant community only found in waters at least moderately rich in lime and usually containing nitrates.

BOTANY (W. H. Pearsall).—The botanical members present were handicapped by the dryness of the summer, Tillmire and Skipwith commons being unusually dry. At Tillmire, few species of interest were noted except *Conium maculatum*, *Apium inundatum*, *A. nodiflorum* and *Samolus Valerandi*.

Askham Bog was more fruitful, though the Carices were long past their best. Mr. F. E. Milsom gathered *Chiloscyphus polyanthus*, *Lophocolea cuspidata*, *Riccia fluitans* and *Ricciocarpus natans*, the two latter liverworts being strikingly abundant. No noteworthy mosses were observed, but *Sphagnum cymbifolium* Ehrh. and *S. acutifolium* Ehrh. were frequent, and *Aulacomnium androgynum* was also present.

Of the higher plants, besides those previously mentioned, the following are worthy of record :—

<i>Sparganium neglectum</i>	<i>Rubus Caesius</i>
<i>Scirpus setaceus</i>	<i>Vicia sylvatica</i>
<i>Juncus obtusiflorus</i>	<i>Thalictrum flavum</i>
<i>Carex riparia</i>	<i>Dryopteris Thelypteris</i>
<i>C. acutiformis</i> v. <i>spadicea</i> Roth.	<i>Carex elata</i>
<i>C. Goodenowii</i> v. <i>junceae</i> Fr.	<i>C. fulva</i>
and v. <i>chlorostachya</i> Druce	<i>C. flava</i>
	<i>C. Ederi</i> v. <i>elatior</i> Abd.

Mr. T. Cryer also observed *Pot. coloratus* on the dry peat of the skating pool.

One of the most striking features of Skipwith Common was the remarkable abundance of *Hypericum elodes* along the margins of the pools, due no doubt to the dryness of the summer.

Gentiana Pneumonanthe, *Utricularia vulgaris*, *Hydrocharis* and *Carex pulicaris* were also observed, and along the river banks *Allium Scorodoprasum* and *Euphrasia nemorosa*.

FUNGI: BASIDIOMYCETES (A. E. Peck).—The long-continued drought had brought about conditions quite unsuitable for the growth of fungi.

Lenzites lepideus grew at the foot of a wood fence in Heslington village. Heslington Common gave no records.

Askham Bog, being much dried up, was probably in better condition

for producing fungi than in its usual flooded condition, and the following species were here noted. :—

<i>Amanitopsis fulva</i> , frequent,	* <i>Russula citrina</i>
esulent	<i>R. xerampelina</i>
<i>Collybia dryophila</i>	<i>Psathyra corrugis</i>
<i>Laccaria laccata</i>	<i>Boletus chrysenteron</i>
<i>Lactarius subdulcis</i>	<i>Polyporus betulinus</i> on Birch
* <i>Lentinus lepideus</i> , on old	<i>Fomes annosus</i> on Conifers
railway sleeper	<i>Tubaria furfuracea</i>

Skipwith Common: A common mushroom, *Psalliota campestris*, growing from roadside dust, and the dung-loving species, *Stropharia semiglobata*, a single dried-up specimen, were the only records.

[*Rhytisma acerinum* was observed sparingly on Sycamore leaves near Fulford].

MICRO-FUNGI (F. A. Mason).—Heslington, Tillmire and Askham Bog produced a number of species of 'rusts,' 'smuts' and other parasitic fungi. One crop of wheat at Heslington was suffering severely from 'blight,' *Cladosporium herbarum*, a cereal pest more usually associated with wet seasons, and under such dry conditions as have been experienced during the present summer one hardly expected to see it so rampant. Two fields of wheat showed a fair amount of 'bunt,' *Tilletia Tritici*. Oats and barley were mostly free from serious fungus diseases, although occasional ears of barley were attacked by the 'covered smut,' *Ustilago Hordei*.

Species of special interest seen at Askham Bog were *Melampsora Larici-epitea* on *Salix cineria*, and the aecidia of *Puccinia Lolii* on the leaves and berries of *Rhamnus Frangula*. A fungus attacking the inflorescences of the Marsh Thistle was found to be *Ustilago Cardui*. The latter is an uncommon species, and *Cirsium palustre* is probably a new host for it.

The most noteworthy species observed at Skipwith was *Claviceps purpurea*, the 'ergot' of rye. Although the ears of corn attacked by this parasite greatly interested the members, its appearance would not be welcomed by the farmer. So far as could be estimated, from 5 to 8 per cent. of the ears of one crop of rye were attacked by this pest, and some of the specimens were unusually large; one ergot measured 3.5 cms. in length. A photograph of this fungus, collected at Skipwith, is reproduced herewith.

The following is a list of the species obtained from the three districts visited :—

A=Askham Bog; T=Tillmire; S=Skipwith.

* New to Mid-West Div. (V.C. 64).

Uromyces Ficariae Lév., on Celandine, A, T.

U. Poae Raben., on Celandine, A.

Puccinia Centaureae D.C., on *Centaurea nigra*, A.

P. Leontodontis Jacky, on *L. Hispida*, A.

P. Taraxici Plowr., on *T. officinale*, A.

P. Menthae Pers., on *M. aquatica*, A.

P. Violae D.C., on *V. canina*, A, T.

P. Caricis Reb., on *Urtica dioica* and *Carex acutiformis*, A.

P. Lolii Niels., on *Rhamnus Frangula*, A.

* *P. glumarum* Er. et Henn., on *Triticum vulgare*, T.

P. Poarum Niels., on *Tussilago Farfara*, A.

Triphragmium Ulmariae Wint., on *Spiraea Ulmaria*, A.

Phragmidium Sanguisorbae Schröt., on *Poterium Sanguisorba*, A.

Zenodochus carbonarius Schlecht., on *Sanguisorba officinalis*, A.

Coleosporium Tussilaginis Tul., on *T. Farfara*, A.

Melampsora Larici-epitea Kleb. (emend. Fischer),
on *Salix cinerea*, A.

Ustilago Hordei Jensen, on barley, T.

U. Tritici Jensen, on wheat, T.



Photo, F.A.M.]

[Bureau Bio-Tech., Leeds.

Claviceps purpurea Tul.

ON RYE.

U. Cardui Fischer v. Wald., on *Cirsium palustre*, A.

U. flosculorum Tul., on anthers of *Knautia arvensis*, A.

Tilletia Tritici Wint., on wheat, T.

- Urocystis* Schröt., on *Ranunculus repens*, A.
Sphaerotheca pannosa (Wallr.) Lév., on wild roses, A, S.
Erysiphe graminis D.C., on cereals, T, S.
E. Polygoni D.C., on vetches, T.
Claviceps purpurea (Fr.) Tul., on rye, S.
Ciliaria scutellata (L.) Quel., on damp decaying wood, A.
Helotium virgultorum (Wahl.) Karst., on damp decaying wood, A.
Dasyscypha virginea (Batsch) Fr., on damp decaying wood, A.
 **Oidium alphitoides* Griff. et Maulb., on leaves of oak, A.
Cladosporium herbarium (Pers.) Link., on wheat, and *Typha*, T, A.
 **Macrosporium Brassicae* Berk., on herbaceous stems, A.
Epicoccum purpurascens Ehrenb., on herbaceous stems, A.
 **Thamnidium elegans* Link., on caterpillar excreta, A.

(To be continued).

—: o :—

Camping, the organ of the Camping Club, reaches us regularly, and is as useful as ever.

Prof. W. W. Watts, F.R.S., has an article on 'The Universities and Technological Education' in *Nature* for August 4th.

Notes on *Amphidasys doubledayi* in the Isle of Man, and on *Porthesia similis* in Cumberland, appear in *The Entomologist* for September.

Heptaaulacus villosus Gyll. and other Coleoptera in North Yorkshire, is the title of a note in *The Entomologist's Monthly Magazine* for September.

J. L. Illingworth has an interesting paper on 'Moorland Vegetation' in *The Olicanian* (the magazine of the Ilkley Grammar School), No. 3 of vol. XXII.

Among the contents of *The Scottish Naturalist* for July, we notice the 'Report on Scottish Ornithology in 1920, including Migration,' by E. V. Baxter and L. J. Rintoul.

'Osmotic Pressure, Root Pressure and Exudation,' by V. H. Blackman, and 'The Reversal of Geotropic Response in the Stem,' by M. J. Lynn, occur in *The New Phytologist* for August 19th.

The Mineralogical Magazine, No. 93, contains a Memoir on the late Sir Lazarus Fletcher (with portrait), by Sir Henry A. Miers; and a paper on the Crumlin (Co. Antrim) Meteorite, written by Sir Lazarus.

We learn from *Nature* of August 11th that 'the smallest rainfall for the twelve months is 11ins., at Howden, Yorkshire, and this is stated as quite without precedent in the United Kingdom, so far as can be seen at present.'

Water for July 20 contains a report of the recent conference of Water Engineers at Hull, including 'The Water Supply of Lincoln,' by C. Horobin, and 'Spurn Point and the Lost Towns of the Humber,' by T. Sheppard, with discussions.

The Vasculum for August contains 'A simple Fungus Parasite,' by A. W. Bartlett; 'Graphite,' by J. A. Smythe; 'Eagles in Northumberland, etc.; and Female Birds Assimilating the Male in Plumage,' by G. Bolam; 'Some observations on our Reptiles,' by C. Robson, and various notes and records.

The September issue of *Conquest* (No. 11, Vol. II., 1/-), contains, amongst others, the following:—'The Hot Springs of Bath,' 'Professor Bragg's Apparatus for the Analysis of Crystals,' 'Tea,' 'How Golf Balls are Made,' 'The Salving of Sunken Treasure,' 'Otters,' by R. I. Pocock, F.R.S.; 'How Black Moths came to Britain,' by H. Onslow; and a review of the first volume of the Transactions of the Royal Society of Edinburgh, taken from an old magazine dated 1788.

NORTHERN NEWS.

If flies are flie because they fly,
 And fleas are fleas because they flee,
 Then bees are bees because they be.—*Yale Recorder*.

The London Museum has issued a 'Guide to the Anglo-Saxon Corridor,' 8 pp. price 3d.

'Local War Records' by the Rt. Hon. the Earl of Onslow, appears in Vol. XXXIII. of *Surrey Archæological Collections*.

The editor of *The Archives of the Cambridge University Forestry Association* appeals for a few dusters and three door-frames.

Wither-Tip and Brown Rot of Plum (*Molinia cinerea* var. *pruni*) is the title of Leaflet No. 367 issued by the Ministry of Agriculture and Fisheries.

The Haworth Ramblers' Programme dealing with the Harden Valley and Bingley, contains many notes on the Geology, Archæology, etc., of the district.

The 'Manchester Conference Souvenir Number' of *The Library World* is well prepared. It contains a criticism of the articles by a 'B. F.' in the *Library Association Record*, to which we had occasion to refer recently.

'Contributed Papers,' is the title of a pamphlet issued in connexion with the South-eastern Union of Scientific Societies' recent Conference at Reading. The papers bear upon the Archæology, Botany, Zoology, and Geology of the area.

We learn from the daily press that 'Some massive bones, apparently of a prehistoric monster, were disinterred by archæologists at Heath, Bedfordshire, but after a long and patient investigation were found to be those of a cart-horse.'

'Matters of ancient gravel and their (*sic*) contents, and questions of a long-ago geographical past, occur to one, when anticipating this visit,' is a sample of the pabulum offered to the South-eastern Naturalists by the editor of their *Bulletin*.

Mr. H. Wade, of Barnsley, while staying at Scarborough in August, reports a specimen of a locust $2\frac{3}{4}$ " long, which his sister picked up on the shore of the North Bay. Mr. W. J. Clarke identifies it as a migratory locust from south-east Europe.

The Irish Naturalist for August is largely occupied by a paper on 'The Post-Glacial Climatic Optimum in Ireland.' It deals with the late estuarine clays, and should be read by those interested in the post-glacial fauna and flora of these islands.

We learn from *The Publishers' Circular* that 'PUBLICITY STUDENT (38), possessing fertile brain, unconventional ideas, untiring energy, desires appointment with publishers where energy can be exclusively devoted to publicity.' A certain East Anglian Society should secure his services.

The Hon. Treasurer of the Yorkshire Naturalists' Union (Mr. E. Hawkesworth, Sunnybank, Crossgates, Leeds) complains that several subscriptions to the Union are still due. As postages are very heavy now, perhaps any member who has not paid will send his subscription as soon as possible.

The Hornsea Urban District Council has just issued an 'Official Guide to Hornsea,' by Frederick Lord (22 pp.). It contains many views of Hornsea—old and new, and brief references to the geology, botany, conchology, etc., of the district. Unfortunately the guide is not dated. It can be obtained from the secretary of the Council, free.

A preliminary meeting in connexion with the British Association visit to Hull in 1922 has just been called by the Lord Mayor. There was a representative gathering, and a strong committee was formed. The Town Clerk (Mr. H. A. Learoyd), and the Museums Curator, Mr. T. Sheppard, were nominated as Hon. Secretaries for the meeting, and the City Treasurer, Mr. T. G. Milner, as Hon. Treasurer. These nominations have been accepted by the Association.

YORKSHIRE NATURALISTS' UNION.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President : G. T. PORRITT, Esq., F.L.S., F.E.S.

TWO MEETINGS will be held in the Library of the Y.M.C.A., Albion Place, Leeds, on Saturday, Oct. 29th, 1921, viz., at 3-15 p.m., to consider and pass the Sectional Reports and to elect Officers for 1922 ; and at 6 p.m., at which entomological topics will be discussed. Exhibits of all orders of insects are requested. Members and Associates of the Union are cordially invited. Notes and records made during the season on Entomological subjects in the county are solicited, and these should be in the Secretaries' hands by Oct. 1st for inclusion in the Annual Report of the Union.

Secretaries :—*Lepidoptera*, B. Morley, Skelmanthorpe ; *Hymenoptera*, Rosse Butterfield, Keighley ; *Diptera*, C. A. Cheetham, Wortley, Leeds ; *Coleoptera* and *Hemiptera*, W. J. Fordham, Newcastle ; *Neuroptera* and *Trichoptera*, G. T. Porritt, Huddersfield.

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The Museums, Hull;

AND
T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

BRYOLOGICAL SECTION.

A MEETING of all interested in Mosses and Hepatics will be held at Raikes Dyke, Holme, on Saturday, November 19th. This is shortly to be the site of a reservoir, and a careful survey is desirable.

Members and others will meet Dr. Woodhead at Holmfirth Station at 10-34 a.m.

Trains from Leeds G.N., 8 a.m.; Bradford, Exch., 9-17 a.m.

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BRIT. ASSOC. HANDBOOK, 1910.
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HIMALAYAN JOURNAL. Hooker.
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NOTES AND COMMENTS.

THE BRITISH ASSOCIATION.

The Edinburgh meeting of the British Association was a tremendous success—almost surprisingly so, even to the most optimistic of its supporters. Whether as a result of the charms of Edinburgh itself, or the energy displayed by Prof. Ashworth and the local committee; or the discussions and correspondence in the scientific and general press since the meeting at Cardiff, or merely the after effects of the war*, or a combination of all these causes, the fact remains that the membership totalled 2768, a number which has rarely been exceeded.

JOINT DISCUSSIONS.

A feature of the meeting was the number of joint discussions. These were well attended, and seemed to indicate that strictly scientific discussions by experts in the particular subjects dealt with were desired. On the other hand, the speakers having been, quite rightly, chosen beforehand, little opportunity occurred for any others interested, to speak. Also, these joint meetings resulted in the work of the sections being interfered with, fewer papers being read, and the discussions on these were necessarily curtailed. Another drawback, perhaps particularly noticeable in Section C (Geology), was the lack of opportunity for the amateur or beginner to bring forwarded the results of his researches. In the past, the Association has rendered incalculable service by the encouragement it has given to these men, and, of course, it must still continue to do so. It is recognised that there are 'cranks' who look upon the Association as a suitable opportunity to 'let off steam,' and it is not always possible to 'put the lid' on them; and on other occasions time is occupied, if not actually wasted, by listening to very elementary talk by earnest but inexperienced people. When, also, the lecture list of any section is particularly full, we think preference might be given to papers which have not previously been delivered and printed. Some papers given we had heard or read in three or four different places previously. This, of course, is a matter for the secretaries of the sections, who are fully aware of the difficulties.

THE HANDBOOK.

In place of the usual 'handbook,' the members received an excellent little volume entitled, 'Edinburgh's Place in Scientific Progress,' which was very welcome, and would probably be read and appreciated by many of the members after their return from the meeting.* It is written by specialists

* This work, printed on thicker paper, is now published by Messrs. W. & R. Chambers, Ltd., Edinburgh, at 6/-, and we can strongly recommend it.

in twenty-five sections, but it was more in the form of a 'gift' or 'souvenir' from the local committee. The object of these handbooks has been to give the visitor an idea of the scientific possibilities of the district visited; if he is a geologist, he wants a clearly written account of the geology of the area; with map, and an indication of the most profitable places to visit; if a botanist, he wishes to get a summary of the botanical features of the district, and an idea of the localities likely to interest him; the archæologist requires information as to the traces of early man in the area, where he can see ancient earthworks, or Saxon Churches; and so on. An ideal handbook, properly indexed, should be a guide to the district from every point of view. It is admitted that at Edinburgh there are plenty of guides already published, but the visitor does not want to waste time finding these guides, and selecting the one most likely to suit his particular purpose; besides, it is much more pleasant to get a handbook to the district, written by specialists, who know the requirements of the members, without having to pay for it!

OTHER LITERATURE.

Owing to the cost of printing, etc., those who make a hobby of collecting the literature in which they are interested—addresses, summaries of papers and so on—were disappointed. The Presidential Address, previously given to members, was a shilling; the list of members, sixpence; and the pamphlets containing the Presidential Address and reprints of the papers read in each section—inaugurated some years ago on the proposition of the present writer—were not available, for the reasons already given. There was, of course, the usual volume of Presidential Addresses—in a paper cover instead of cloth—marked, 'Price, Six Shillings,' though it was on sale to the members at 4/6; but even at this reduced price, many were debarred from purchasing a number for sending to friends who were unable to attend—a privilege we formerly enjoyed. Most of the geologists present had presented to them a copy of the excellent 'Geology of the District around Edinburgh,' by Dr. Flett and others (reprinted from *The Proceedings of the Geologists' Association*), but this we believe was a personal favour on behalf of the authors, and was in no way official. But it supplied the geologists with what they missed in the 'handbook.'

THE ADVANCEMENT OF SCIENCE: 1921.

With the above heading the various Presidential Addresses delivered at Edinburgh were issued in one volume, and for the first time included the Address to the Conference of Delegates. Besides the Presidential Address of Sir T. Edward Thorpe, the publication contains 'Problems of Physics,' by Prof.

O. W. Richardson ; ' The Laboratory of the Living Organism,' by Dr. M. O. Forster ; ' Experimental Geology,' by Dr. J. S. Flett ; ' Some Problems in Evolution,' by Prof. E. S. Goodrich ; ' The Application of Geography,' by Mr. D. G. Hogarth ; ' The Principles by which Wages are determined,' by Mr. W. L. Hichens ; ' Water Power,' by Prof. A. H. Gibson ; ' The Boundaries of Physiology,' by Sir Walter M. Fletcher ; ' Consciousness and the Unconscious,' by Prof. C. Lloyd Morgan ; ' The Present Position of the Theory of Descent, in relation to the early history of Plants,' by Dr. D. H. Scott ; ' The Place of Music in a Liberal Education,' by Sir Henry Hadow ; ' The Study of Agricultural Economics,' by Mr. C. S. Orwin ; and ' The Message of Science,' by Sir Richard Gregory. We only wish we were able to reprint each one in this journal !

ZOOLOGICAL BIBLIOGRAPHY.

In the ' Report of the Committee on Zoological Bibliography and Publication,' submitted at Edinburgh, we learn that in *The Naturalist* for September 1st, 1920, the chief recommendations were quoted, and contributors asked to adhere to them. The editor of the Yorkshire Geological Society consulted the Secretary of the Committee on the correct way of writing specific names. Since the particular instances occurred in a paper on palæobotany, the reply sent was kindly read and approved by Dr. A. B. Rendle. Many zoologists otherwise competent seem unaware that an author's name should be enclosed in brackets, *e.g.* *Dalmanites caudatus* (Brünnich), only when the species has been transferred from the genus in which the author originally placed it, *e.g.* *Trilobus caudatus* Brünnich. It would be equally correct to write *Dalmanites caudatus* Brünnich sp. There is also confusion in some minds as to the use of brackets in connection with generic and subgeneric names. The trilobite just mentioned was long placed in the genus *Phacops* ; this fact may be indicated thus—*Dalmanites* [*Phacops*] *caudatus*. At first *Dalmanites* was regarded as a subgenus of *Phacops*, and this would have been indicated correctly by : *Phacops* (*Dalmanites*) *caudatus*.

NUMBER OF SECTIONS.

An Extraordinary Meeting of the General Committee was held at Edinburgh to consider suggestions for a reduction in the number of Sections. It was proposed by Dr. P. Chalmers Mitchell, and seconded by Sir E. Sharpey Schafer, that the Council be asked to take into further consideration the re-organisation of the Sections, either by reducing their number or by combining them, and to report to the General Committee. The following amendment was proposed by Mr. D. Berridge,

and seconded by Mr. T. Sheppard—to add after the above Resolution the words: ‘.....bearing in mind that, since no new Section has probably been formed without about three years’ deliberation, it would be unwise to abolish any in a shorter time.’ This amendment was lost. The following amendment was proposed by Sir. F. Ogilvie and seconded by Professor F. O. Bower—to omit all words after ‘that’ in the above Resolution, and to continue: ‘.....The General Committee commends the action of the Council in encouraging arrangements for joint discussions on subjects of interest to two or more sections.’ The above was carried by a very large majority as an amendment and as a substantive motion.

A GEOLOGICAL SOCIETY’S MEDAL.

The Liverpool Geological Society has issued a medal, the



obverse of which has the words ‘Liverpool Geological Society, founded 1850, Awarded to,’ and on the reverse is a representation of a slab of Triassic sandstone with impressions of two labyrinthodont footprints. Four copies have been awarded posthumously to the late G. H. Morton, T. M. Reade, J. Lomas and H. C. Beasley, the medals being handed to the relatives of the recipients. We are permitted to reproduce the illustration of the medals, from the Society’s Proceedings.

ANCIENT ANEMONES.

At the meeting of the British Association at Edinburgh, Miss Nelson, of that city, kindly invited the members of Section ‘D’ (Zoology) to see some interesting anemones. These, which belong to a smallish species found on the Scottish coast, have been kept successfully in an aquarium on Miss Nelson’s library table for no fewer than fifty-nine years, so that they must be older than that. Only simple means of

aerating the water with a syringe are adopted, and the animals are fed once a month on butcher's meat. Several generations of descendants of the original anemones are flourishing also in other aquaria. The water is changed every six or eight weeks. Miss Nelson tells a story of another sea anemone that was named 'Granny,' which lived in a tumbler in the Botanical Department at the University of Edinburgh for sixty years. It went into residence near the beginning of last century, and was left by the professor of Botany to his successors by will.

HUDDERSFIELD MUSEUM.

'Angles, Danes and Norse in the District of Huddersfield' is the title of the Tolson Memorial Museum Publication, No. 2 (62 pp., 1/-), by W. G. Collingwood. The memoir is admirably prepared and illustrated by numerous views of local Anglo-Danish crosses, etc., reproductions and restorations of which have been placed in the Museum. The idea of these handbooks—dealing with history, geology and natural history—is excellent, and we are pleased to see that several others are in preparation.

RECORDING SECTIONS IN GRAVELS.

The Gravels Committee of the Geologists' Association has made the following suggestions for recording details of Sections in Gravels:—The record should comprise (1) Notes on the position, height, and constituents of the gravel; (2) Measured diagrams; (3) Photographs of interesting structures. POSITION.—Give 1-inch map, No.——; 6-inch sheet, No.——, State distance and direction of the section from some permanent structure, *e.g.*, 560 yards N.W. of———Church. HEIGHT.—For all sections give the range of the base, *e.g.*, from 25 to 40 O.D. Distinguish clearly between the base level and the level of the surface of the gravel spread. SECTION.—Measure as accurately as possible. Show the various beds in a diagram. Number the beds. Add notes on any really important features in (a) materials—sands, loams, gravels; (b) their condition—loose, cemented, angular, etc.; (c) bedding, normal, current-bedded, unstratified; (d) thickness; (e) colour; (f) signs of movement or disturbance; (g) underlying formation. FLINT IMPLEMENTS AND FOSSILS.—Obtain all possible information as to their exact relation to the beds. (Great caution is necessary when purchasing specimens). NON-LOCAL ROCKS.—These may yield most valuable evidence bearing on the age, mode of origin, and derivation of the gravel. CORRELATIONS.—Add any observations which may throw light on the relation of the deposit to other superficial deposits.

NATURAL HISTORY IN 'ARMS.'

The ammonites or snake-stones, usually represented by the species *Ammonites communis*, have formed the arms of the town of Whitby for a considerable time, and, as is well known to collectors of old Yorkshire tokens, a half-penny, by Henry Sneaton, in 1667, bears representations of three snake-stones. Two examples of these tokens have been placed with the 'snake-stones' in the Hull Museum to illustrate the prominence these fossils obtained nearly three centuries ago. The arms of Street, near Glastonbury, include a representation of an *Ichthyosaurus*, and a letter recently received from Sir



George Fordham showed the arms of his County Council (in Norfolk) supported by two Great Bustards.

BIRDS AND FORESTRY.

It is pleasing to have to record the evidence of a competent observer upon the usefulness of birds, both to the agriculturist and the forester. In a paper entitled 'The Principles of Forestry,' recently given before the members of the Yorkshire Branches of the Surveyors Institution and Land Agents' Society, Mr. John Maughan, of Jervaulx Abbey, a Professional Associate Member of the Council, whole-heartedly advocates the protection of birds as an aid to Forestry. He says:— 'Although damage by insects, fungi and animals is outside the limits of this paper, attention may be called to the necessity of encouraging and protecting birds, which are the invaluable unpaid workers on the forester's staff, by leaving nesting-places (such as walls and hollow trees), especially on the sunny sides of the woods, and, if necessary, providing nesting boxes. It would even pay to feed them during severe storms, as their utility cannot be overestimated. The much-abused pheasant destroys the pupæ and caterpillars of many injurious insects. During the visit of the Royal English Arboricultural Society of Yorkshire in July, 1914, an attack of the large larch saw-fly was observed in one of the Jervaulx Woods, which was reported to the Board of Agriculture and Fisheries, who, owing to the outbreak of war, had no time to deal with the matter, but urged that means should be taken to prevent it spreading, and, for want of a better, pheasants were turned into the wood. Whether these birds took the

place of the ichneumon flies—which there was no time to import or obtain from Thirlmere—may be disputed ; *but the fact remains that the attack disappeared.*

MANX MINES AND MEGALITHS.

In *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, just issued, W. H. Corkill has a short paper with the above title, in which, by the aid of maps and illustrations, he demonstrates the wonderful wealth of material for the archæologist and geologist in the island. He describes various prehistoric remains, and his summary is given under the following headings :—Stone Circles, Standing Stones, Cairns and Cists, Sacred Wells, Hut Habitations of Stone, Neolithic Floors or Platforms, Sources of Metal, Precious Stones, Mermaids and Mermen, Flint Weapons and Implements.

A MAMMOTH STORY.

It is interesting now and again to dip into the books which interested our ancestors a century ago, and the following extract shows that they were entertained in a similar way to what we are to-day. The extract is taken from 'The Imperial Magazine, or Compendium of Religious, Moral and Philosophical Knowledge,' Vol. I. for 1819. 'It appears, according to some accounts lately received from the interior of the United States, bordering on the Mississippi, that the whole of the gigantic race of quadrupeds is not yet extinct ; one having been recently seen in the remote deserts stretching on the north-west quarter of the American continent. If these accounts are to be credited, the Mammoth is not carnivorous, but lives chiefly on a particular shrub, which grows plentifully, in the districts where it has taken up its abode. It is represented as never lying down to take rest, but as reclining against convenient trees, where it finds repose. The mammoth which is said to have been lately seen is reported to be about fifteen feet high, and in other respects nearly proportionable. It has no horns, is apparently inoffensive, is covered with remarkably long hair, and rather bears a resemblance in appearance to the Wild Boar than to the Elephant.'

PRINTING COSTS CRIPPLING RESEARCH.

A spirited attack upon the high cost of printing and its effect in paralysing research work was made by Sir Charles Oman, M.P., at the annual conference of the Library Association at Manchester recently. A great part of the work of scientific, literary, and historical research, he said, first took shape in papers and monographs appearing in publications of learned societies. At the present time there was a blight upon the whole of these publications. Some had ceased

altogether to appear, others appeared in diminished form, and 'the crude fact which explains this lamentable falling-off,' he declared, 'is that printing is practically doubled in price, while the funds of societies remain practically fixed at pre-war figures.'

CLASSES WHICH HAVE NO WAR PROFITS.

'The reason for this contrast is that in the main the individuals who form the learned societies do not belong to the class of those who have profited by the war. The incomes of the whole professional, literary and academic classes from whom the membership of the learned societies is drawn have moved very little. They have not been among the profiteers; hence it is impossible for societies to procure funds by raising subscriptions to a much higher level. On the other hand, the individuals who have the manual work of printing and binding in their hands belong to Trade Unions which utilised the war for the purpose of getting their wages doubled by constant threats of strikes. It is the case of the miners and private householders told over again—a privileged class enjoying a monopoly, and, well organised, has succeeded in exploiting the public. The result is that the public cannot afford to buy what it used to buy, whether it be household coal or newspapers of scientific interest.'

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White Wagtails in Yorkshire.—On Saturday, 10th September, at Cookridge, near Leeds, were about 20 to 25 migrating White Wagtails. Among them were a few Pied, as well as immature, birds. A small lot of 7 Whites, 2 Pied, and 1 or 2 immatures remained on the edge of a small duck pond, and allowed me to watch them, with and without glasses, for quite half an hour, at less than 10 yards range: and the Pied birds were useful in assisting identification.—JASPER ATKINSON.

Short Eared Owl and Crossbill in the West Riding.—While searching for the nest of a Merlin on the moors of the Skipton district last May, Mr. Wm. Rowan, (*The Naturalist*, September last, page 318), mentions having come across the nest of the Short-eared Owl. The Merlin used to breed every year on Barden Moor, and I presume it will do so yet. Formerly many Crossbills visited the woods about Barden in winter, and a few years ago a pair, I believe, was seen all the summer, but no nest was found. It is possible, if not probable, that it occasionally nests there. My brother saw the Green Woodpecker in Bolton Woods last August, and one of my sons saw one at Farnsworth, near Barden, about the same time.—E. P. BUTTERFIELD.

YORKSHIRE BATS.

H. B. BOOTH, F.Z.S., M.B.O.U.

THE BARBASTELLE BAT AT HELMSLEY.—As this species was only added to the county list last year (*The Naturalist*, 1920 pp. 379-80), Mr. F. H. Edmondson and I spent the first week-end in June at Helmsley with Mr. A. Gordon, in order to make further investigations. Our efforts were successful, and I am glad to say that the Barbastelle appears



Immature male Barbastelle (about 6 weeks old), and adult male Barbastelle.
About $\frac{2}{3}$ ths natural size.

to be well established, and in some numbers there. On the evening of June 4th, in the basement of an old ruin in Duncombe Park, we found two adjacent colonies, which we estimated contained about forty bats each. In both colonies they all came out almost together, like a shower. We managed, however, to secure four, all pregnant females. I dissected one, and as the embryo measured seven-twelfths of an inch as it was released from the uterus—and in a semi-circular position—it was very evident that birth would have taken place within two or three weeks at the latest.

As so little appears to be known of the breeding of the Barbastelle, we returned to the ruin on the following evening with some borrowed angler's landing-nets to try to get some undamaged females. The bats had evidently changed their quarters, but as on the evening before several kept returning to the building, with difficulty we managed to net one—another pregnant female. This we left the next morning, on our way home, to the care of Mr. Riley Fortune, so that he might

watch developments ; but unfortunately it refused food from the first, and died within a week.

On July 28th, Mr. Gordon found a young male *Barbastelle* hanging from the ceiling of the ruin where we obtained the bats. It was dead, but quite fresh, and serves to confirm my statement that the females caught on June 4th and 5th would soon have given birth in the natural order of events. Mr. Gordon sent the young bat on for my inspection. It is a little over half grown, and is almost a perfect miniature of the adult ; with the exception that it has a few more white-tipped hairs on the fur of its back, which tend to longitudinal streakiness. On the under side, the fur is distinctly whiter, more especially on the abdomen and the sides of the body. As this specimen is mounted in a crawling position I could not measure its total length. I made the following measurements : those in parenthesis being from an adult female of the same species—Head and body, without tail, $1\frac{9}{16}$ ins. (2 ins.) ; length of radius bone, $1\frac{1}{2}$ ins. (2 ins.) ; length from thumb joint or wrist to tip of wing, $1\frac{3}{8}$ ins. (2 ins.). Judged by these particulars, the growth must have been fairly rapid. Later, Mr. Gordon netted nine *Barbastelles* one evening as they entered or left the ruin, releasing all but one that was injured. This time they consisted of eight males and one female.

In the open the *Barbastelle* appears to fly slower and straighter than other bats, and frequently returns backwards and forwards over the same beat, usually about thirty to forty feet above the ground. But inside a building, it is very much the opposite, and it twists and wheels about at a great speed, and in the semi-darkness is a most difficult creature to catch. Of the five *Barbastelles* taken, we sent one each to the Hull, Bradford and Keighley Museums.

THE LESSER HORSE-SHOE BAT IN YORKSHIRE.—Whilst we were endeavouring to catch *Barbastelles* on June 5th, we noticed from time to time, one or two of a smaller and much lighter coloured species flying amongst them. Eventually Mr. Gordon managed to secure one, and it proved to be a Lesser Horse-shoe Bat. This is a most valuable and interesting record. It has always been a problem to zoologists as to why an apparently isolated colony of this species should have occurred so far north in Great Britain as North Yorkshire. The late Major Barrett-Hamilton, when writing his 'History of British Mammals,' urged me to use every effort to prove that this species still existed in Yorkshire. In the meantime, Mr. Cuthbert Hastings, at my request, had kept on the alert for bats of any kind when descending pot-holes in the north-west of the county—but all to no purpose. It is now more than a quarter of a century since the last Lesser Horse-shoe Bat was recorded from the neighbourhood of Pateley Bridge,

and that record has been looked upon by some as suspicious. The last record before that was in 1886 ; only four years after the publication of its occurrence in the county (*The Zoologist*, 1882, p. 186), although the record was made from two specimens collected in 1876. After exhaustive inquiries, and a thorough search, we concluded that the species was now extinct in Yorkshire (see *The Naturalist*, 1915, p. 207). It is needless to say what pleasure and delight I, as the writer of that report, felt on being present at the capture of a living Lesser Horse-shoe Bat in an entirely different district, and equally as far north in Yorkshire ! It proved to be a female, heavy in young. Mr. Gordon has tried to secure another one, but so far without success.

THE REDDISH-GREY BAT (*Myotis nattereri*) AT HELMSLEY.—On June 5th, Mr. A. Gordon and I investigated a pot-hole on a hillside of the Deer Park in Duncombe Park. We saw two or three small bats of a lightish colour, but were unable to secure any. Later, Mr. Gordon captured one, and it proved to be a female Reddish-grey or Natterer's Bat. He has since taken two males of this species at the ruin where the Barbastelle's are, one of which I have seen.

A CORRECTION.—In my note on the bats of Duncombe Park (*The Naturalist*, 1920, p. 380), I included the Whiskered Bat among the five species that Mr. Gordon had then taken there. He had only one specimen of this bat, which I have since seen, and Mr. Gordon now agrees with me that it is Daubenton's Bat. Its face contains more hair than is usual with that species—hence the error in its identification. The Whiskered Bat, therefore, must be eliminated from Mr. Gordon's list of bats for Duncombe Park. It is a splendid list for Yorkshire, and is the only district that can equal the Barnsley district with its seven species. Duncombe Park, with its ruins, old trees, river, etc., is an ideal place for bats, and, no doubt, one, or perhaps both, the two other species on the Yorkshire list will eventually be found there. As an illustration, I may state that during a very favourable evening this summer, Mr. Gordon netted nine Barbastelles, thirteen Pipistrelles, two Natterer's, and five Long-eared Bats ! These nine Barbastelles and two Natterer's bats I have mentioned before, and of the whole ' catch,' all but three were liberated.

P.S.—Since writing the above I have received the loan of an adult male Barbastelle from Mr. Gordon, which is set up in the same way as the young male, viz., in a crawling position. The photograph (for which I am indebted to Mr. W. J. Forrest) shows them about three-fourths natural size, and gives a fair idea of comparison in size and bulk between the young and old male.

FIELD NOTES.

Spotted Crake near Whitby.—On September 27th, at Hagg House Farm, Ruswarp, near Whitby, a Spotted Crake was shot by Mr. A. S. Frank of Whitby.—F. SNOWDON, Whitby.

Meta menardi in Kirkdale Cave.—Prof. Watson informs me that he has obtained this large spider in Kirkdale Cave.—J. T. SEWELL.

It has previously been recorded for the county (see *The Naturalist*, December, 1920).—ED.

White Kittiwake at Bridlington.—A beautiful white variety of the Kittiwake has frequented the Bay during the autumn. The plumage is pure white, bill ivory, and legs white. The specimen would have been a perfect albino had the eyes been pink instead of light brown in colour. Arrangements have been made to protect this bird as far as may be possible.—SYDNEY H. SMITH.

Yorkshire Fishes.—A Barbel of 9 lbs. weight was caught in the Derwent at Wheldrake by Wm. Dodd, of York, on Oct. 1st, 1921. A Gudgeon, 7 inches long and weighing 2 ozs., was caught in the River Seven by Thos. Wood of York on Sept. 8th, 1921. Two very evenly matched Perch were caught in a private lake near York on Sept. 20th, 1921, by E. W. Jones, of York; together they weighed 5 lbs.—SYDNEY H. SMITH, York.

Common Rorqual at Scarborough.—On the evening of September 30th, a rough sea, accompanied by an easterly wind washed ashore in the North Bay at Scarborough a small specimen of the Common Rorqual (*Balaenoptera musculus*). It measured 27 feet in length, and had evidently been dead for some time, as most of the outer epidermis was eroded, and the body was much distended with gas. It had been on the beach for some hours before I heard of it. When I reached the place all the baleen had been removed, but the interior of the mouth was slate grey in colour, and the strongly compressed hinder part of the body and general colouration left no doubt as to the species.—W. J. CLARKE.

We learn from the press that during the process of cutting up the whale by the Scarborough Corporation, a brief hitch occurred. The whale is a 'royal fish,' and when cast ashore is claimed by the Crown. Representation was made on behalf of the Crown of their rights in the matter, and almost immediately the task was continued under their auspices. The 'right' involved does not affect the municipality, who, in surrendering responsibility, at the same time freed themselves from the cost of removing the whale.—ED.

VEGETATION OF DRYING MUD AND RETARDED GERMINATION.

E. J. SALISBURY, D.SC., F.L.S.

(Continued from page 332).

In the present season six samples of mud were taken from the Welsh Harp from a depth of 3 to 6 inches, after the top 3 inches of exposed mud had been removed. Any seeds present may, therefore, be assumed to be several years old at least. Three samples were moistened and placed under conditions favourable to germination, whilst the remaining three were first sun-dried. In all three of the latter seedlings appeared, whilst none appeared in the three former; when these in turn had been sun-dried and remoistened, however, two samples exhibited seedlings. Unfortunately, during the writer's absence, all the seedlings died, so that their identity is unknown. The results, however, demonstrate the presence in the mud of dormant seeds, perhaps of considerable age, and the stimulating effect of dessication.

In examining the vegetation of the exposed mud the development of aerenchyma was noted in many individuals, the species involved being *Bidens cernua*, *B. tripartita*, *Epilobium hirsutum*, *Lycopus europaeus* and *Scutellaria galericulata*.

A very interesting distribution of hairs was noted for *Polygonum nodosum* v. *salicifolium* growing amongst other plants, chiefly *Malachium aquaticum*. The leaves produced in the shelter of the surrounding vegetation were densely hairy beneath, whilst those in the less humid air above were only sparsely hairy. Moreover, some of them which were partly sheltered and partly exposed exhibited the same distinction between the respective parts. The condition was thus the very reverse of that exhibited by *Ulmaria palustris* (c.f. R. H. Yapp, *Ann. Bot.*, pp. 815-870, 1912.)

Vegetation on Exposed Mud.

Species.			Little Ting	Elstree	Welsh Harp
<i>Alisma Plantago</i>	...	...	×	o	o
<i>Alopecurus fulvus</i>	...	...	f—r.r.	f	—
<i>A. geniculatus</i>	...	...	l.f. (edge)	l.f. (edge)	l.c. (edge)
<i>Apium inundatum</i>	...	...	—	c	—
<i>A. nodiflorum</i>	...	...	×	o	—
<i>Atriplex hastata</i>	...	...	o	—	—
<i>A. patula</i>	...	...	×	—	o—c
<i>Bidens cernua</i>	...	...	—	l.c.	r
<i>B. tripartita</i>	...	...	o	c—f	f.c.—l.ab.
<i>Butomus umbellatus</i>	...	...	×	l	—
<i>Callitriche stagnalis</i>	...	...	f	o	×
<i>Carex</i> sp. (vegetative)	...	...	o	—	—
<i>Chenopodium album</i> var. <i>rescuenis</i>	...	...	—	—	o
<i>C. polyspermum</i>	...	...	—	—	v.r.
<i>C. rubrum</i> var. <i>blitoides</i>	...	...	o—f	—	v.ab. (ca. 70%)

			Little Tring	Elstree	Welsh Harp
<i>Cirsium arvense</i>	...	...	r	×	r
<i>Cnicus lanceolatus</i>	...	...	—	—	r
<i>Dactylis glomerata</i>	...	...	v.r.	—	—
<i>Eleocharis acicularis</i>	...	...	l.f.	l.c.	—
<i>E. palustris</i>	...	...	—	l.c.	—
<i>Elodea canadensis</i>	...	...	×	c	—
<i>Epilobium hirsutum</i>	...	...	r	—	o
<i>Galium Aparine</i>	...	...	—	—	r
<i>Glyceria aquatica</i>	...	...	×	c	—
<i>G. fluitans</i>	...	...	×	c	—
<i>Gnaphalium uliginosum</i>	...	...	c	l.f.	o
<i>Holcus lanatus</i>	...	...	r	×	r
<i>Juncus bufonius</i>	...	...	c	×	—
<i>Limosella aquatica</i>	...	...	v.ab.	—	—
<i>Lolium perenne</i>	...	...	—	—	r
<i>Lycopus europæus</i>	...	...	—	×	—
<i>Malachium aquaticum</i>	...	...	r	r.r.	o
<i>Matricaria suaveolens</i>	...	...	r	—	r
<i>Nasturtium amphibium</i>	...	...	×	×	—
<i>N. officinale</i>	...	...	o	o	—
<i>N. palustre</i>	...	...	c	f	f
<i>Peplis Portula</i>	...	...	×	f	—
<i>Plantago major</i>	...	...	f.c.—c	o	o
<i>Poa annua</i>	...	...	r.r.—o	×	o—f
<i>P. trivialis</i>	...	...	—	—	o
<i>Polygonum Aviculare</i>	...	...	r	—	—
<i>P. amphibium</i>	...	...	f—l.ab	o—l.ab.	l.f.
<i>P. nodosum var. salicifolium</i>	...	...	f	f	o
<i>P. Persicaria</i>	...	...	—	—	o
<i>Potamogeton coloratus</i>	...	...	—	f	—
				(lowest zone)	
<i>P. natans</i>	...	...	—	l	—
<i>P. perfoliatus</i>	...	...	—	o	—
<i>Potentilla anserina</i>	...	...	f—f.c.	r	r.r.
<i>P. reptans</i>	...	...	o	—	—
<i>Ranunculus circinatus</i>	...	...	×	—	—
<i>R. Flammula</i>	...	...	—	×	—
<i>R. pellatus</i>	...	...	—	c	—
<i>R. repens</i>	...	...	r	—	v.r.
<i>R. sceleratus</i>	...	...	f	o	o—f
<i>Rumex conglomeratus</i>	...	...	r	—	r—o
<i>R. limosus</i>	...	...	—	—	a.b.
					(upper marg.)
<i>Scutellaria galericulata</i>	...	...	—	×	—
<i>Senecio Coronopus</i>	...	...	f.c.	—	—
<i>Senecio aquaticus</i>	...	...	—	r	—
<i>S. vulgaris</i>	...	...	r	—	—
<i>Solanum Dulcamara</i>	...	...	×	×	—
<i>Stellaria media</i>	...	...	f.	—	r.r.
<i>Trifolium repens</i>	...	...	r	—	—
<i>Urtica dioica</i>	...	...	o—r	—	o—r
<i>Veronica aquatica</i>	...	...	r	—	—
<i>V. Beccabunga</i>	...	...	r.r.	o	o
<i>V. serpyllifolia</i>	...	...	l.ab.	×	—

ab=abundant ; c.=common ; f.c.=fairly common ; f=frequent ; o=occasional ; l=local ; r=rare ; r.r.=rather rare ; ×=present, but frequency not determined.

‘ BURNETS ’ OF FILEY, YORKS.

H. DOUGLAS SMART, M.C., M.D., F.E.S.

ON June 25th and 26th last I spent a week-end at Filey, not intending to collect insects, but, nevertheless, hoping to renew my series of *Zygaena lonicerae*.

On the sea front there are some ‘gardens’ where one may collect ‘burnets’ by paying the admission fee of one penny, and I can recommend the expenditure of that sum to any lepidopterist who finds himself in Filey at the end of June. There is no apparent reason why the man in the street should wish to enter the enclosure. As a matter of fact he seldom does, and one may collect in comfort, separated from the general public by an iron railing.

There were two species just emerging from the cocoons, *Z. filipendulae* and *Z. lonicerae*, the former being the more numerous to the extent of four or five to one. *Filipendulae* was a little in advance of the other, presenting more wasted specimens, but this did not account for more than a trifling preponderance, as its more highly glazed cocoon with the ends of different tints was also the more numerous. Many cocoons of both species had been neatly opened by an oval hole below the bulge on the free margin, and the pupa abstracted.

An interesting phenomenon, new to me, was the congregation of several males on a grass-head, on the stem of which was an intact cocoon. There were several instances of this, and in one case where the males were of both species the cocoon produced a *filipendulae* ♀ next morning.

Wing vibrations cannot supply the attractive stimulus in this case, although a cage full of burnet cocoons gives out astonishingly loud clickings in the morning sunshine when the moths are coming out.

A long search for aberrations was not too successful. The best finds in this respect were two thinly scaled *filipendulae* with the complexion of *Z. exulans* or *meliloti*. There were, too, a few *filipendulae* showing confluence, some of the middle pair of spots, some of the distal pair. Blurring of the spots by invasion of the ground colour by red scales was also noted.

Z. lonicerae showed no variation worthy of mention.

The most interesting insects taken were about a dozen that I feel sure are hybrids. They all have the sixth spot very greatly reduced and traversed by a dark nervure, as in *Z. hippocrepidis* Stephens. They all have the black border of the hind wing intermediate in width between those of the supposed parents. In this they differ from Irish specimens of

hippocrepidis received from L. W. Newman, in which the black border is reduced to a mere line. Richard South, however, in 'The Moths of the British Isles,' describes the border in *hippocrepidis* as rather broad. Hybridism in the zygaenid moths is of course no new thing, and South (*loc. cit.*) mentions *filipendulae* and *lonicerae* hybrids from a Yorkshire locality. The ab. *hippocrepidis* is supposed to be a cross between *filipendulae* and *trifolii*, and occurs occasionally when colonies of the two species are close to each other. It is also well known that hybrids in this genus are capable of fertile pairing.

I failed to find any pairings between the two species, but did see one of *filipendulae* and the alleged hybrid. This leads me to suppose that although such pairings have been observed in nature, and although I saw what appeared to be the assembling of males of both species to an unemerged *filipendulae* ♀, cross pairings must be relatively rare.

If the tendency to cross-pairing were in any degree comparable to the tendency to true pairing, and if the Filey *filipendulae* are every year in the same numerical superiority, that species would gradually absorb the other. In fact, if the mixed colony be of any antiquity, *Z. lonicerae* would have already disappeared from it.

When breeding these insects it is difficult to obtain good specimens. They emerge in the morning for the most part and crawl over each other while their wings are drying. When put in the cyanide bottle they crawl over each other in a sort of frenzy, and indulge in frequent short acts of copulation for about half an hour before finally dying. I can recommend leaving the cage in bright sunlight for a short time, and then placing it for some hours in a dark cupboard. Emergence will start with the sunlight and continue after it is cut off, and the insects will remain quiet till dry. The administration of a drop of methylated chloroform to each in a separate pill-box will anasthetize the insect for long enough to avoid the curious stage of excitement that cyanide induces in this genus. —SHELLEY, HUDDERSFIELD, September 5th, 1921.

It must be forty or more years since I first collected *Z. lonicerae* at Filey, and on that visit the species was in the utmost profusion on the slopes of the cliffs. But, although so long ago, I remember noting that there were practically no *filipendulae* among them, and I don't know that I saw even one. The date of my visit, I believe, was two or three weeks later than that of Dr. Smart, so it is, of course, possible that *filipendulae* may have been already over. That it has been known to occur at Filey for many years, however, is evident from Mr. J. W. Taylor's record of it there, in the first edition of 'Yorkshire Lepidoptera.'—G. T. P.

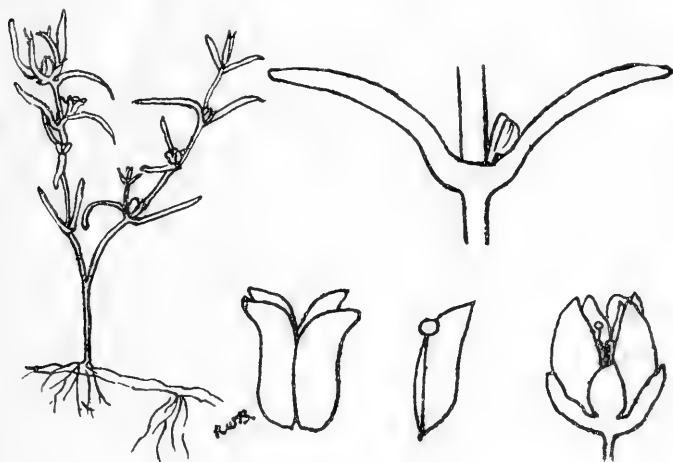
A NEW BRITISH FLOWERING PLANT

TILLÆA AQUATICA L.

R. W. BUTCHER.

WHILE at Adel, near Leeds, on September 1st, I found a small plant growing on the margin of a pool, which proved to be *Tillæa aquatica* L. (nat. order *Crassulaceae*), a species new to Great Britain.

It is a small, bright green, succulent, glabrous plant, from 1 to 3 inches high, somewhat of the habit of a *Sagina*. Stem erect or decumbent, rooting at the lower nodes, the lower portion faintly red. Leaves glabrous, opposite, entire, linear, $\frac{1}{2}$ in. long, connate at the base, sessile. Flowers,



TILLÆA AQUATICA L.

sessile, or with a very short pedicel, axillary, solitary, one in each pair of leaves, $\frac{1}{10}$ in. diam., 4-partite. Sepals small, green, ovate, blunt, united at the base. Petals white or pinkish, lanceolate. Stamens 4, opposite the petals, alternating with 4 wedge-shaped staminodes; the filaments very slender, anthers spherical. Gynoecium apocarpous, of four carpels, each 6-10 seeded, the upper portion only slightly recurved when mature.

The above plant differs from the description of the German plant in the very feeble development of any red tint to the stem, and in the less recurved upper portion of the fruit.

A sub-species (*T. Vaillantii*) with flowering pedicels longer than the leaves occurs in France and Italy.

It was the dominant plant growing in abundance on the

drying-up mud on the margin of the pool, associated with : *Polygonum minus*, *P. Hydropiper*, *Limosella aquatica*, *Radicula palustris* and *Callitriche*. On the bare mud it was semi-prostrate. Further from the water among the *Polygonum* it was more erect and two or three inches high.

There does not appear to be any reason why this plant should not be a true native, as it is in grounds that are seldom visited, and in many seasons it is probably covered by the water, in the same way as the species of *Elatine* and *Subularia*.

Dr. G. C. Druce has kindly examined the plant, and he agrees that it is probably native there or brought there by natural means.

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DISTRIBUTION OF CERTAIN ELEMENTS OF THE BRITISH FLORA.*

J. R. MATTHEWS, M.A.

A CARTOGRAPHIC study of certain portions of the British Flora is made. Flowering Plants only are dealt with, Babington's *Manual of British Botany* being used as a basis for analysis. Data relating to distribution in the British Isles are taken from Watson's *Topographical Botany* and Lloyd Praeger's *Irish Topographical Botany*, while, for continental distribution, reference is made to Nyman's *Conspectus Florae Europaeae*.

The portions of our Flora, the distribution of which is presented cartographically, do not correspond exactly to those elements that have been variously described as Iberian, Atlantic, Germanic, Scandinavian, etc., but are defined geographically in terms of their distribution within the British Isles. Thus, plants of the British Flora confined to England are mapped collectively. Plants occurring in England and Ireland, but not in Scotland, are treated as another portion, and are similarly mapped, and so on. It is obvious that maps thus obtained will help to visualise the mass distribution of these portions of our Flora, and taken in conjunction with the European distribution of the same plants, they may help to substantiate one or other of the numerous views held in regard to that migration of plants from the continent which re-populated these islands after the Glacial Period. The exact effects of the glaciation of Britain on the Flora are still disputed, and until Geologists come to the aid of Botanists in this matter, the latter will continue to have no definite starting-point. But there is sufficient evidence to believe

* Abstract of paper read to the British Association at Edinburgh.

that temperate plants, at least, did not survive the rigours of the Ice Age, and there must have been a re-immigration of these types, therefore, in post-glacial times.

By whatever means those temperate plants (about 270 species) of our Flora, which occur only in England, reached Britain, it is clear from the map that their headquarters are in France, while in England they are most abundant in the south and south-east counties, gradually thinning out as we move north and north-west. This seems to indicate the main lines of migration followed by the bulk of our temperate Flora. Similar conditions seem to have affected the migration of about seventy species which have reached England and Ireland, but which are absent from Scotland. On the other hand, the distribution of over a hundred species confined to England and Scotland indicates a co-mingling of southern and northern types. About 40 of these species are found in Scotland and in the north of England, but are absent from south and south-east England. These boreal types may have migrated more from east to west, rather than from south to north. This may help to explain their greater prevalence in north Britain, although the possibility of their having been exterminated in the south during or since the incoming of a southern temperate flora has to be considered.

Sixty species confined to Scotland represent probably the oldest portion of our Flora. Whether they survived the Ice Age on 'Nunataks,' or reached their present stations after the retreat of the ice, they are best regarded as relics of that old palæarctic Flora which girdles the globe within the Arctic Circle, but which, during the period of maximum glaciation, was driven southwards in every longitude.

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Calopteryx virgo Linn. in Cumberland.—In my paper on the Dragonfly fauna of Cumberland (*The Naturalist*, 1917, pp. 357-358), I regarded this species as a local and somewhat scarce insect. It was not until the present season that I met with it again, when, on May 25th, I saw quite a number on the banks of the River Eden between Warwick Bridge and Wetheral. The flight of *C. virgo* is not strong, but I was not able to capture more than three specimens, the river at that point being overhung with trees, the low, spreading branches of which interfered with the use of the net. These are all males, and the wings are of the smoky brown colour usual in immature examples, as was to be expected from the somewhat early date. My previous Cumberland captures were in late June and early July.—F. H. DAY, Carlisle, 12th September, 1921.

In Memoriam.

F. ARNOLD LEES, M.R.C.S.

By the death, which took place on Sept. 17th, of Mr. F. Arnold Lees, of Meanwood, Leeds, Yorkshire loses one of its best-known botanists. Mr. Lees was the son of a Leeds medical man. He was himself educated for the medical profession, and qualified in 1871 as a Member of the Royal College of Surgeons, and Licentiate of the Royal College of Physicians.



For many years he practised in Leeds, residing for a long period at Meanwood Lodge. As pointed out in *The Yorkshire Post*, it was as a botanist rather than as a doctor that he was most widely known. As long ago as 1878 he was associated with the late J. W. Davis, at one time Mayor of Halifax, in the production of a book on 'West Yorkshire,' which gave an account of the geology and botany of the Riding. The work went to a second edition, and except in respect to the more populated parts of the Riding, where changes have been great, it has never lost its value. In 1888 the *Yorkshire*

Naturalists' Union published a very large and thorough 'Flora of West Yorkshire,' which Mr. Lees had written with the aid of many leading botanical observers in the county. The work at the time was regarded as the best of its type which had been published in England, and a further volume bringing its record up to date, and making many suggestive comments on natural history, was announced before the war, but has never been published. In recognition of his services to science he was elected as an honorary member of the Yorkshire Naturalists' Union. In 1892 he also wrote an 'Outline Flora of Lincolnshire.' He was for many years secretary and recorder for the Botanical Record Club of England, and he has contributed local floras for several of the Dales of Yorkshire to various local publications. An enormous collection of about 25,000 specimens of English wild plants, which he accumulated during his botanical wanderings, was purchased nearly twenty years ago by the Bradford Corporation, and it is now in the Cartwright Hall, while his library of floras and other botanical works is in the Bradford Free Library, and is separately catalogued.

Although he pursued particularly systematic botany, he was by no means without a keen appreciation for the more poetic side of his subject, and he was a frequent contributor of short poems to various publications.

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JOHN GARDNER, F.E.S.

(1841-1921)

Born at Egglestone, in Upper Teesdale, December 28th, 1841; died at his residence, Laurel Lodge, Hart, near Hartlepool, on July 21st last, in his eightieth year; came to reside at Hartlepool at an early period, where he subsequently carried on business as a timber merchant. He became a member of the Yorkshire Naturalists' Union in 1885, and a Fellow of the Entomological Society of London in 1890.

By the death of John Gardner, one of the best type of naturalists has gone from us; while interested in many groups, he will be best remembered for his work among the Lepidoptera and Coleoptera. No entomologist in the North of England since the time of the well-known John Sang has done more to further the knowledge of the species habiting the county of Durham, and more especially the neighbourhood of Hartlepool, in which district, with the exception of occasional visits to his native country, Egglestone and Upper Teesdale, he did practically the whole of his collecting. He was a collector in the best sense of the word, in that he studied the life history and habits of the insects,

and considerably added to the knowledge of the life history and habits of many species not previously described, especially among the Micro-lepidoptera, which he collected from the first. Under the influence of Mr. Blatch, he took up the study of Coleoptera in the middle 'eighties,' and he worked the group so thoroughly, and followed up rare and hitherto obscure species so keenly that a great number of species was added to the County list. The coast line between Hartlepool and Castle Eden provided ground he was never tired of working, and here he was turning up new additions almost up to the last; only recently he recorded the addition of *Plusia moneta* to the Durham fauna, a species that first became known in the south of England not long ago, and has gradually spread up through the country.

He also worked the Greatham Marshes to the south of Hartlepool, where some species of plants and animals probably reach their most northerly locality; for instance, one of the 'plumes' *Adactyla bennetii* which occurs freely on *Statice limonium*, the masses of which plant, when in flower, are quite a pleasing feature of these marshes.

Among the rare insects he took was the Oleander Hawk Moth, *C. nerii* in 1885; in the year 1888, when *D. galii* was especially plentiful in some parts of the county, he took the species near Hartlepool, and considering that there would probably be larvæ on the *Galium* on the sea banks, succeeded in finding them there also. Among the many interesting 'micros' were *Eudorea conspiciualis*; *Halonota grandævana*, which at one time he took and bred in numbers; *Halonota turbidana*, of which he discovered the larva and described it along with Mr. J. W. Corder, comparatively recently; *Tinea picarella*, a lovely tineia of which he discovered the larvæ feeding in fungi on alder; and *Lithocolletis insignitella*, of which he found the larvæ freely on clover in the district, the only locality for the species in the British Isles.

He contributed notes occasionally to *The Naturalist* and most of the Entomological Journals for many years, and was generous in his help and assistance to most of the eminent entomologists of his time, including Buckler, in his Monograph on the Larvæ of British Lepidoptera, for which he was the means of finding the hitherto undescribed larva of *Miana expolita* (*captiuncula*); J. W. Tutt, in his numerous publications; F. N. Pierce, in his works on 'Genitalia'; C. G. Barrett, in whose work on British Lepidoptera some of his most interesting varieties were illustrated; Eustace Banks, in tracing out the life history of many of the 'Micros'; and in the Catalogue of the Lepidoptera of Northumberland and Durham, by J. E. Robson. A glance through the latter work shows how much it owes to his energy, more especially in

the 'Micro-lepidoptera,' the part which, owing to the death of Mr. Robson before its completion, he completed and saw through the press.

I first met Mr. Gardner at a Yorkshire Naturalists' Union meeting, at Kildale, in July 1890, when acting as leader of the entomologists at that meeting, and he was the 'party.' From that time he has been my friend and entomological guide, and never a season passed from that time until his death without my making one or more visits, either to collect with him or have my undetermined and doubtful captures identified by comparing them with the specimens in his extensive collection and with his able and willing assistance. He presented his collections of British Lepidoptera and Coleoptera to the Hancock Museum at Newcastle-on-Tyne, and they were removed to that institution shortly before his death. They should prove invaluable to students in the future, and will provide a most fitting tribute to the great work he did in furthering the knowledge of these groups.

He was laid to rest in the churchyard adjoining the ancient church of Hart, on July 23rd, 1921. He leaves a widow to mourn his loss, which is shared by many who were his intimate friends, and to whom our deepest sympathy is extended.—
T. A. LOFTHOUSE.

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Diotis maritima in Scilly Isles.—Mr. W. B. Haley's record of the above species as occurring 'in the north-east coast of St. Martin's, *Diotis maritima* in abundance' (*The Naturalist*, 1921, p. 328), restores it to the Cornish Flora; the last specimen was gathered in 1881 on Pra Sands, by Messrs. Ralfs and Marquand. Before that it was not known to have occurred for a century. *Spiranthes autumnalis* was recorded by Townsend in his 'List of Scilly species' in *The Journal of Botany* for 1864. It is a fairly common plant in Cornwall.—A. BENNETT.

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R. S. Bagnall and J. W. H. Harrison describe 'New British Cecidomyiidae' in *The Entomologist's Record* for October.

Among the contents of *The South Eastern Naturalist* for 1920, we notice 'Modern Advances in Anthropology and Economics' (the Presidential Address by Sir Edward Brabrook); 'The Glaciation of the South Downs,' by Edward A. Martin; 'First steps in a Local Survey,' by C. C. Fagg; 'Migration of Lepidoptera as regards the British Islands,' by Robert Adkin, and 'The Eastward Extension of the Lusitanian Florula,' by Prof. G. S. Boulger. There is also a lengthy report of the Eastbourne Congress. Mr. Martin's paper has already been dealt with in these pages (July, 1920, pp. 217-218 and Sept, 1921, p. 319). The Society appeals for funds to carry on its magazine; proper and severe editing would make such an appeal unnecessary.

YORKSHIRE NATURALISTS AT YORK.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.SC.

(Continued from page 351).

VERTEBRATE ZOOLOGY (S. H. Smith).—The section was officially represented by the President (Mr. H. B. Booth), and Mr. S. H. Smith, President of the Section. At Heslington and Tillmire the usual common species of birds were observed. Swallows and the two martins have been exceedingly scarce, and the landrail is rarer than ever before in a district that usually harbours a fair number. Possibly the continued rains and bad weather last year materially helped to reduce this species. The turtle dove now breeds fairly regularly around York, and several pairs have nested here during the summer. There is a marked increase in the numbers of the turtle dove locally, and in my opinion it has extended its range considerably, as, in addition to the place under review, I have observed it this year at Raskelf, Easingwold, Malton, Pocklington, Aldby Park, Dunnington, Skipwith, and Benningborough. Large numbers of bird castings (pellets of food refuse), ejected from the digestive organs, were picked up on the top of the rabbit warren at Tillmire; they consisted in every case of husks of oats mixed with small stones, and a few elytra of beetles, many being still wet from recent ejection. A big flock of jackdaws and rooks got up on our approach, and it was concluded they were the responsible parties, and probably driven to an excessive cereal diet because of the scarcity of insect life as the result of the drought. As there are abundant crops of wheat and barley as well as of oats in the vicinity, it would be of interest to know why these birds should prefer the latter. Mr. Booth discovered a little owl that had been killed and thrown down in a field near Fulford; this, I believe, is the nearest record of its occurrence to York—one was obtained at Deighton Grove, about a mile further out from the city (V. J. F. Zimmerman).

Askham Bog was visited on July 31st, and bird life was conspicuous chiefly by its absence. Many of the summer visitors have departed, and resident species are well hidden in the primeval thickets of reeds, sallows, and birches. Plenty of ringdoves, stockdoves, moorhens and magpies were seen, a few whitethroats, sedgewarblers, a bullfinch, sparrowhawk and kestrel, and on the old brickpond some tufted ducks and mallards. Here again swallows and martins were very scarce and landrails were entirely absent. Borings of woodpeckers were seen, and may have been made by both green and great spotted varieties.

Skipwith Common had been reserved for Bank Holiday Monday, August 1st, and a full day was devoted to it. The Common is noted for its gullery, but it was too late in the year to view either adult or young black-headed gulls; they having all departed to the coast. As a result of the exceptionally dry spring and summer, the visitors had the almost unique experience of walking dry-shod across the site of the gull ponds; those ponds that still held water had attracted and retained various aquatic birds. Several small parties of herons were seen, and at one time 21 herons on the wing together gladdened ornithological eyes; these birds had most probably been bred at Stillingfleet heronry. Half-a-dozen herring gulls flew leisurely away when disturbed from a patch of ooze, and near by was seen plenty of teal (our smallest British duck), numbers of mallards and wild duck, a pochard, two golden plover, a redshank and several snipe. In the woods we observed some large parties of jays, plenty of ringdoves and stockdoves. The shoveller duck and nightjar were not seen, but both species have bred on the Common this year. The writer caught a glimpse of a bird that might have been a hen harrier, probably companion to one obtained a few miles south-east of Skipwith last February. This bird was also seen by Mr. Wroot, but, unfortunately, the President, Mr. Booth, missed the sight, as he was following a flock of

jays through a dense plantation at the time the harrier (?) was noticed. The lapwing or green plover appeared to be very numerous, and plenty were observed here as well as at Tillmire and Askham Bog.

MAMMALIA.—Rabbits are the great feature on Tillmire; the ground for hundreds of square yards is honeycombed by their burrows, and as evening draws on the 'bunnies' pop out of the ground in every direction until the whole area is covered with the gambolling animals; a few black ones are conspicuous amongst the crowd of brown fur and white cotton tails. This great colony has occupied the spot for many years, and appears to hold undisputed sway. At Skipwith, Mr. Booth nearly trod upon a fine dog fox which loped coolly away, followed by a hearty 'tally ho' from those of the party privileged by the view. A very small shrew in a rather decomposed condition was found, and may have been the lesser shrew. Traces of squirrels were found in all the pine woods, and rabbits were abundant, and a few hares were seen.

REPTILIA AND AMPHIBIA.—A dead viper, killed on Skipwith Common, was seen hung in a cleft stick near the village inn, and a few common frogs were noticed on the Common. Some very young specimens of the great newt were discovered underneath grass roots at the edge of a pond on the Tillmire.

MOLLUSCA (Greevz Fysher).—None of these was observed on the excursion to Heslington and Tillmire, but at Askham Bog the following were obtained:—

Limnæa stagnalis, a number of large specimens. It is worthy of note that an unusual occurrence previously said to have been observed was confirmed on this occasion, as 3 of these Hermaphrodite Snails were mutually connected.

Planorbis corneus was found in good numbers and fine large examples. In addition the following were noted—*P. contortus*, *Segmentina nitida* (one living), *P. spirorbis*, *S. putris*, var. *cristata*, *P. umbilicatus*.

On the Tadcaster Road several beautiful *Helix nemoralis* of various banded forms were observed—*H. hortensis*, vars. *lilacina* and *incarnata*, *H. cantiana* (plentiful), *H. rufescens* (plentiful).

Mr. Sowden showed a most populous colony of *H. arbustorum*, hundreds of specimens being observed in a space of 4 or 5 square yards, together with *H. hortensis*, *H. aspersa* and *H. rufescens*.

On Monday, at Skipwith, the Conchologists turned to the river Derwent at a distance of 2 or 3 miles near Thorganby. From the river itself *B. tentaculata*, *N. fluviatilis* (dead), *P. amnicum*, *S. corneum* and *L. peregra* were taken; and from a Pond near the river *P. corneus*, *P. umbilicatus*, *P. spirorbis*, *P. contortus*, var. *cristata*, *Sphærium corneum*, *Pisidium* sp. (numerous), *L. peregra*, *Physa hypnorum*, *P. fontinalis*, *S. lacustre*. On a dry swamp near the road *P. obtusale* was obtained, and on the road side *H. nemoralis*, vars. *undulata*, *rubella*, *libellula*, also *H. cantiana*.

LEPIDOPTERA (A. Smith).—Many of the ponds were dried up, and members interested in this group had the opportunity of observing closely the stems of *Typha* for the borings of the Bulrush Wainscot, *Nonagria typhæ*, many pupæ were found which started to emerge the following day.

A specimen of *Hepialus humuli* was picked up at rest; the moth was a male and quite fresh looking, the species was plentiful early in June; this is quite a late record.

Several *Cidaria pyraliata* were disturbed from the undergrowth, this being a common species at the Bogs. *Ortholitha limitata* was common on all the grassy patches.

A specimen of *Geometra papilionaria* was found at rest.

One larva of *Mamestra pisi* was picked up almost full fed, this being

unusually early, and a larva of *Calocampa vetusta* was found, the latter being an uncommon species at the Bogs. Larvæ of *Collix sparsata* were just putting in an appearance on the yellow loosestrife.

At Skipwith, two larvæ of *Smerinthus ocellatus* were found feeding on sallow by the roadside near the village.

Several species of larvæ were beaten from birch trees, among them being *Lophopteryx camelina*, *Notodonta dromedarius*, *Drepana falcataria* and several *Geometra*.

Chrysophanus phlaeas were very plentiful on the flowers of the ragwort. No Lepidoptera were observed at Tillmire and Heslington.

DIPTERA (John H. Ashworth).—The spell of dry weather was responsible for a paucity of numbers both as regards individuals and species in this section excepting the Clegg Fly, *Hæmatopota pluvialis*, whose attentions to the members of the party were too unremitting to be altogether pleasant.

Between the thunderstorms on the Tuesday, however, a decided change came over the scene, and then every plant of ragwort had its two-winged visitor. On the Sunday or Monday it was necessary to take practically every individual that presented itself.

Askham Bogs on the last day of July proved chiefly notable for yielding *Tetanocera sylvatica*, *T. coryleti* and *Elgiva albiseta* in the Acalypterate section of Muscidae, whereas on the Tuesday afternoon Syrphids predominated, notably *Pyrophaena granditarsa* and *Chilosia bergenstammi* with *Syrphus cinctellus* and *Sphærophoria menthrasti* (var. *picta*). Beyond the common *Helophilus pendulus* it is believed that *S. transfugus* and *S. trivittatus* or *S. hybridus* were present, but not secured.

The chief attractions of the visit to Skipwith Common were the Tachinid *Echinomyia grossa* on the patch of ragwort near the station, and the Anthomyid *Lispe tentaculata* on the sand bordering the large pond from which the herons were disturbed. *Sicus ferrugineus* was on the ragwort in the village, and the party that proceeded by the river was rewarded with *Conops flavipes* and *Chilosia scutellata*; *Sericomyia borealis* being also taken on this excursion.

COLEOPTERA (A. E. Winter).—Fair numbers of common species were noted at Skipwith Common, but no new records for the county were obtained. The most interesting finds were *Blethisa multipunctata* L., a rather uncommon beetle found in marshes, and *Litargus bifasciatus* F., under bark on the common, both taken by Mr. T. Stainforth. Mr. W. J. Fordham has taken these in the same district, the former from Bubwith, the latter from Allerthorpe Common. *Rhantus grapii* Gyll. was obtained at the gull ponds, from which it has previously been recorded by Mr. G. B. Walsh.

The remaining beetles noticed were as follows:—*Pterostichus nigrita* F., *Agonum ruficorne* Gooze, *Rhantus bistriatus* Berg., *Agabus sturmi* Gyll., *Helochares punctatus*, *Helophorus griseus* (minutus), *Adalia obliterata* L., *Mysia oblongoguttata* L., *Anatis ocellata* L., *Coccinella 10-punctata* L., *C. 7-punctata* L., *Myrrha 18-guttata* L., *Luperus rufipes* Scop.

CORRECTION.—For '*Urocystis* Schröt.', first line, p. 351, read '*Urocystis Anemones* Schröt.'

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We have received some parts of *Der Pilz-und-Kräuterfreund*, a publication devoted to the study of fungi.

We notice that further 'discoveries' are being made at Grassington, including 'two pieces of Roman glass vases beautifully ornamented.' We have not seen these, but if they are 'beautifully ornamented,' they are hardly likely to be Roman. Some authority should really be consulted before these wild statements get into the press.

BRITISH ASSOCIATION NOTES AND NEWS.

THE Conference of Delegates of Corresponding Societies had two very successful meetings, at the first of which Sir Richard Gregory's admirable address was followed by a discussion on Science and Citizenship, and at the second were several addresses on Regional Surveys—one result of which will, it is hoped, be shown at the Hull meeting next year.

When the present writer arrived at Edinburgh, and he was not late, he was gratified to find that all the 2,000 members' tickets had been used up—and he received an 'Emergency Members' Ticket,' No. 2527. While wondering what an 'Emergency Member' might be, his mind was set at rest by a large rubber stamp across the ticket, which supplied the information that he was an 'Old Annual (Regular),' and a hardy one, we hope!

On the Saturday an ambitious excursion was arranged to 'Loch Lomond, Loch Katrine, and the Trossachs, *via* Stirling, Bridge of Allan and Callandar, limited to 200. Cost, including two meals, 48s.' It began at breakfast time, and the one surviving car-load reached Edinburgh about midnight, having spent the day in getting wet through, and hastily seeking food. Otherwise, the trip was 'dry.' By a series of unfortunate circumstances, for which no one was responsible, conveyances broke down, or the wrong kind were provided, boats were missed, and some members even had not time for either lunch or tea. Many were unable to complete the journey. Yes! the Loch Lomond excursion will be remembered, if only by those who tried to get their money back!

But the trip provided a plentiful supply of rainbows, any way. While discussing the question of the probable distance that rainbows were away from an observer, the matter was settled in one instance. The boat was steaming along quite close to the edge of the lake, and the end of a rainbow occurred between the passengers and the shore—probably fifty yards away, the trees and crags on the lake-side being quite clearly seen *through* the rainbow.

To some of the party there was one gleam of hope on the Loch Lomond trip. The ship had a 'bar,' and the cold and wet travellers hied thither. But the proprietor promptly closed the door, as he said he could do better with the luncheons?

The Zoologists visited the Scottish Zoological Park, and had tea there; the two Hull members were privileged to see the Red Lions feed, the Red Lion Club having been revived.

Grants for scientific research, amounting to over £800, were awarded at the Edinburgh meeting.

In Section 'L' (Education), Dr. Kimmins, chief inspector of elementary schools in the London district, had been analysing the sense of humour in school-children, and on his first request for funny stories and jokes was overwhelmed with 10,000, which, he said, cured him of funny stories for life. An inspector wrote up on a blackboard, 'Do not throw matches about; remember the Fire of London.' As he left he heard a small boy say, 'Don't spit; remember the Flood.' A favourite story is that of the old woman whose parrot used to say, 'I wish the old lady was dead,' so was sent to the rector's house to companion his more religious bird, who at once added to his visitor's sentence 'We beseech Thee to hear us, good Lord.' 'When Lloyd George was at your age he was top of the form,' said a teacher, to which the boy replied, 'When he was the teacher's age he was Prime Minister.' A nervous man, reading the lessons, reads at the bottom of one page, 'Moses was sick,' turns over two pages by mistake, and continues, 'and the lot fell upon Aaron.'

Sections A. C. D. K. joined in a 'Discussion on the Age of the Earth.'

Prof. Reynolds submitted the Twentieth list of Geological Photographs, which included a number of Yorkshire photographs, by himself.

A report of Experiments in Inheritance of Colour in Lepidoptera was submitted, in which we are informed three times in less than a page, that a full report will appear in the *Journal of Genetics*, and thrice also, that 'the experiments will be continued.'

The Final Reports on 'Charts and Pictures for use in Schools' was presented, and contains valuable information.

The *Sunday Observer* tells us that The British Association is one of the institutions which just save science and popular thought in this country from the analogy of those parallel lines which never meet.

In his report on 'Modern Whaling Statistics,' Sir Sidney F. Harmer pointed out that the examination of reports by Government officials, supplemented by voluminous statistics which have been furnished by the whaling companies, at South Georgia and elsewhere, to the British Museum (Natural History), has shown that there are indications of a serious diminution in the number of whales, in an industry which commenced so recently as the end of 1904. In the case of the humpback, a marked decrease in the number of individuals captured commenced after the end of the season 1911-12; while there is reason to fear that a similar decline in the numbers of blue whales commenced after the end of the season 1917-18.

—: O:—

The *Irish Naturalist* for October is entirely occupied by a paper on 'The Relation of Song to Nesting in Birds.'

W. G. Sheldon writes on 'The Life-cycle and habits of *Cydia leguminana* Z., with a note on its synonymy, in *The Entomologist* for October.

Notes on the Great Auk (illustrated), by W. H. Mullens; and 'Note on the Red-backed Shrike,' by J. H. Owen, occur in *British Birds* for October.

'Notes on Down and Dublin Plants,' by R. L. Praeger, and 'Irish Ichneumonidae and Braconidae,' by W. F. Johnson, appear in *The Irish Naturalist* for September.

Among the contents of *Camping* for October we notice 'The South of England Tour,' 'Heavyweight's Holiday in Wales,' 'Late October in Lakeland,' and 'Pigs and Pitches.'

An excellent series of articles on 'The Stones of London,' by J. V. Elsdon and J. A. Howe, is appearing in *The Quarry*; the September issue dealing with Magnesian Limestone.

Among numerous papers and notes in *The Journal of Conchology* for September, we notice 'Notes on the Growth and Variation of *Unio pictorum*,' by W. E. Alkins, and 'Mollusca of Oundle,' by C. E. Y. Kendall.

Among the papers in *The Entomologist's Monthly Magazine* for October are *Stenopelmus rufinasus* Gyll., an addition to the list of British Coleoptera; *Anthrenomus cinctus* Kollar in Britain, and *Aradus betulae* L., an addition to the British Hemiptera-Heteroptera.

In *The Naturalist* for July, p. 225, reference was made to a curious nesting site in Shipley Glen, where some Blue Tits built their nest in the body of a hobby horse on a roundabout. A photograph of the actual 'horse,' with the bird leaving the nest, appears in *The Selborne Magazine*, No. 347, just issued.

The *Antiquaries Journal* for October contains, among many other items, 'Two Relic-holders from Altars in the Nave of Rievaulx Abbey'; 'Ancient Settlements at Harlyn Bay,' 'The Polygonal Type of Settlement in Britain,' 'Neolithic Bowl,' etc., from the Thames, and 'Hoard of Currency Bars found near Winchester.'

The October *Science Progress*, besides the usual useful summaries and reviews, contains papers on 'Some Implications of the Chromosome Theory of Heredity,' by J. S. Huxley; 'Some Biological Effects of the Tides,' by F. W. Flattely, 'Symbiosis and the Biology of Food,' by H. Reinheimer, and 'Some other Bees,' by H. Mace.

YORKSHIRE NATURALISTS' UNION : GEOLOGY.

THE Annual Meeting of the Geological Section of the Yorkshire Naturalists' Union was held at Huddersfield on Saturday, October 8th. In the afternoon several members who are investigating the fauna of the Millstone Grit Shales visited Slaithwaite under the guidance of Mr. W. S. Bisat and Rev. H. Thomas. This excursion provided the leaders an opportunity of demonstrating the method of zoning the beds by means of the goniatites. In the shales exposed in a disused ganister quarry near Kitchen Clough *Glyphioceras reticulatum* was found in plenty, while at Holt Head, a mile further up the valley, *G. bilingue* was the dominant species.

The evening meeting was held in the Technical College, Dr. T. W. Woodhead presiding. The Secretary reported that during the year considerable progress had been made with the zoning of the Millstone Grit Shales. Members of the Committee had attended two excursions arranged by the Leeds Geological Association, with good results. Some attention had been given to the investigation of the Peat, and it was suggested that the beds on Grassington Moor would repay examination.

Dr. Woodhead reported finding birch in the peat on Pule Hill at 1400 feet. Mr. W. R. Barker reported that he had a large collection of Coal Measure Plants awaiting identification, and that Dr. Kidston had promised to examine them at an early date. Mr. Barker appealed to the Section not to neglect the lacustrine fauna of the Coal Measures. Mr. W. S. Bisat read a paper on 'Recent Progress in the Investigation of the Millstone Grit Shales,' and exhibited specimens of the Zone Goniatites. He described in detail a large number of the goniatites found in the shales, and pointed out several gaps in the succession which require to be filled in before the work is completed. The officers of the Section and the various Committees were re-elected. Mr. H. C. Versey, M.Sc., Leeds, was elected a member of the Carboniferous Rocks, Fossil Flora and Fauna Committee. The next Annual Meeting of the Section will be held at Halifax on Saturday, October 14th, 1922.—J. HOLMES.

—o—

MARINE BIOLOGY COMMITTEE AT ROBIN HOOD'S BAY AND SCARBOROUGH.

THREE mornings, 1st to 3rd September, spent at Robin Hood's Bay, confirmed a number of records previously noted as pertaining to this Section of the Yorkshire Coast. Some organisms were found which are mentioned in Scarborough and Filey lists, but not in that of Robin Hood's Bay. In the laminarian zone, several fine specimens of the comparatively rare crab, *Pilumnus hirtellus*, were taken, and also *Galathea strigosa*, which appeared as a strange visitor among tribes of *G. squamifera*. On the under surfaces of large stones compound ascidians flourished magnificently. Of these, *Leptoclinum durum*, *L. punctatum* (new to list), *Botrylloides rubrum*, *Botryllus schlosseri* and *B. babius* were much in evidence. Search was made for an anemone, *Sagartia bellis*, inscribed as a R.H.B. record, but it was not discovered. It does not seem to be an inhabitant of the East Coast, at any rate Scarborough and Filey pools have not produced it, so it is to be presumed that this record may be a mistake. In this search, two anemones in the 'button' state were detached from the under-side of a lias shell, which might prove to be the coveted *Sagartia bellis*, as they emitted a few white threads from their bases, just as sagartians do when irritated. Both anemones, however, were pure white, softer than sagartians, possessed a multitude of tentacles in several rows, and, except in size and development, conformed to the description of *Actinoloba* (*Dianthus*) *plumosa*. In the young condition, before the characteristic tentacular 'lobes' are formed, it is possible to mistake a plumose anemone for a sagartian. Although *Actinoloba plumosa* occurs at Scarborough, it has not hitherto been noted

for Robin Hood's Bay. Monday, 5th September, was utilized for work among Scarborough rock-pools, under ideal conditions of tide and weather, but no additions were made to the numerous records of previous years, notwithstanding the large amount of material examined.—J. IRVING.

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CORRESPONDENCE.

ARENARIA GOTHICA Fr.

In *The Yorkshire Post* of September 30th, 1911, a note appeared headed 'Indigenous Plants,' and speaking of the above species, reports it as 'now fast spreading over two or three counties, for it has been largely deported by interested botanists.' What authority is there for the above, what are the counties, and who are the interested botanists? These unqualified statements are of no value, certainly botanically; but who was the writer, and why are they made?—A. BENNETT.

—: O :—

C. Davies Sherborn and Tom Iredale write on 'J. F. Miller's *Icones*' in *The Ibis* recently. A recent discovery by Sherborn renders changes in nomenclature necessary, as, for example, on page 307 we learn '*Pheniculus purpureus* (Miller). This now will be the correct name for the bird long known as *Irisor viridis*, afterwards as *I. erythrorhynchus*.' And (p. 309) '*Ardea naviæ* Miller. This is earlier than *Ardea naviæ* Boddaert in use for the American form of *Nycticorax nycticorax*, and it appears doubtful whether these are exactly the same thing,' etc.

The Nineteenth Century and After, for September, among eighteen valuable essays, contains 'The Curlew in Devonshire,' by Dr. Gordon, and 'Matters of Fact,' by Sir Ray Lankester. In the latter Sir Ray is at his best, and uses his pen with some effect in exposing the absurdities of an article by a reverend gentleman named Clarke in a previous issue of the journal, in which the reverend gentleman's 'grandiose ambition is to discredit the Darwinian doctrine of the evolution of man from the lower animals.' We should like Mr. Clarke to reply, if he can!

—O—

Field Mapping for the Oil Geologist.—By C. A. Warner. x.+ 145 pp., 40 illustrations, price 13/6 net. New York: John Wiley and Sons, Inc.; London: Chapman & Hall, Ltd., 1921. The five chapters in this small manual deal with the study of field conditions, maps and their interpretation, field mapping and methods, field mapping instruments and useful tables and meridian determination. The aim of the author has been to furnish a handbook of field methods that would be of value to those geologists who have had little experience with the methods commonly used in examining a territory not yet drilled. To a beginner the work may be useful, but little occurs in the text which is not fully covered by a first year course in oil geology at any recognised school or university. The pages dealing with the interpretation and compilation of both topographic and geologic maps contain much useful information referring entirely to the features of the United States territory. The author assumes throughout that the geologic conditions for reconnaissance and structural mapping are ideal, a state of affairs, however, which rarely obtains in the field. An interesting and instructive chapter deals entirely with the modern instruments and appliances used by the petroleum geologist, and contains much valuable information, especially to British students who are usually unfamiliar with American field methods. The last sixty pages of the book comprise useful tables and meridian determination. These may have a certain value from a reference point of view, but are unnecessary in an elementary treatise of this nature. There is a good index.—G.S.

NORTHERN NEWS.

Our contributor, Mr. H. H. Thomas, has been re-elected Fellow of Downing College, Cambridge.

The Report for the year 1920-21 of the Director (Alex. O. Curle), the Royal Scottish Museum, Edinburgh, (23 pp., 6d.) has been published. Cheltenham Museum Publication, No. I., is entitled 'Notes on the Rock Specimens in the Museum,' and is by Capt. R. P. Wild (49 pp., 6d.)

The rope by which criminals were hanged on Benenden Heath has been presented to the Maidstone Museum by Canon Horsley. We hope Mr. Allchin will put it safely away.

We are glad to see that the *Scarborough Philosophical and Archæological Society* keeps the continuity of its Reports by the publication of those for 1915-1919, together in one cover (8 pp.).

Among some fossils, etc., for sale in a recent catalogue we notice 'Echinus, or micraster, with bedding,' 'Pagurns,' 'Gonialibas,' and chrysoprase. It seems an interesting collection!

Dr. Collinge, of the Museum, York, would be glad to receive any species or varieties of Terrestrial Isopoda (Woodlice) from Yorkshire, in connexion with a monograph he has in hand.

Mr. S. Matthewman favours us with a copy of his interesting poems, entitled 'The Gardens of Meditation,' published in Leeds—one or two of which we remember having read previously.

The *Journal of the Ministry of Agriculture* for September contains two papers of particular importance to naturalists, viz., 'Scarcity of Swallows,' by H. Boase, and 'Raspberry Gall Fly,' by H. W. Miles.

We learn from the Linnean Society's Circular, No. 391, that '*Pilobolus* may well be described as a fungus with an optical sense-organ or simple eye; and, in using its eye for laying its gun, it appears to be unique in the plant world.'

'*Sherbornina*, a new genus of Fossil Foraminifera from Table Cape, Tasmania,' is the title of a paper read the other day before the Linnean Society by F. Chapman, the new genus being called after our contributor, C. Davies Sherborn.

Dr. B. Muriel Bristol gives 'Some Aspects of the Work of the late Professor G. S. West, M.A., D.Sc., F.L.S.' in part 4 of Vol. XIV. of *The Proceedings of the Birmingham Natural History and Philosophical Society*, recently published.

We have received the Report of the Somerset County Museum for the past year, which contains details of numerous additions. The heading (p. 11), 'Animals, Birds, Insects, etc.' should read 'Mammals,' etc., as surely birds and insects are animals?

The *Report of the Castle Museum Committee of Norwich*, recently to hand, contains a portrait (with memoir,) of the late James Reeve, F.G.S., who was 'officially connected with the museum for seventy-three years.' The report also contains a list of additions, etc.

In October was published Part XII. of Witherby's excellent *Practical Handbook to British Birds* (pp. 257-352, 4/6). It is devoted to the Ducks, and contains numerous illustrations, including a really fine coloured plate of the wing coverts, etc., of several of the species dealt with.

We have received No. 1 of the *Bulletin of the Carmichael Medical College* at Belgachia. It deals with the Fungi of Bengal, is very well illustrated, and the author, S. R. Bose, expresses his deep sense of gratitude 'To Mr Petch, the famous mycologist of the Botanic Gardens Herbarium, Ceylon.'

The Wackerfield Dyke, County Durham, is described by A. Holmes and Stanley Smith in *The Geological Magazine* for October. The same journal also contains a paper 'On a Local Alteration in Limestone Shales at Wensley, Derbyshire,' by C. S. Garnett, who blames ozone for some of the phenomena noted.

We should like to congratulate the *Whitby Literary and Philosophical Society* on the publication of its *Ninety-eighth Annual Report*, which not only contains a big list of additions by gift and purchase, but two interesting papers; 'Notes on Whitby's Water Supplies,' by T. H. Woodwark, and 'A Ford at Whitby,' by J. T. Sewell.

We have received 'Land-og vatna-lindýr á Íslandi (Fauna molluscorum extramarinorum Islandiæ) [i.e., The non-marine molluscan fauna of Iceland], by Hans Schlesch, reprinted from the Reports of the Scientific Society of Iceland (35 pp.). In this is a surprisingly large number of references to notes in *The Naturalist*.

No. 3 of the current issue of 'The Olicanian' has a report of the school natural history society, a paper on 'Moorland Vegetation,' by J. L. Illingworth, and numerous other interesting items. For some things we regret that Illingworth is leaving the school, but he has kindly arranged that we shall see its interesting journal in the future.

We are glad to see from the syllabuses of the various Societies which are sent to us that a distinct revival in interest is being taken in the work of natural history Societies. The lists of lectures and excursions are, in many cases, extraordinarily gratifying, and increases in membership and in scientific work are being recorded up and down the country.

Besides details of the various activities of the Society, the *Annual Report of the Manchester Microscopical Society* for 1920 contains 'Alpine and sub-Alpine plants of Switzerland,' by F. E. Weiss; 'Sacculina and its effects on the host species,' by W. M. Tattersall; and reprints of notes and records by the Society's members, from the *Lancashire and Cheshire Naturalist*.

British Birds for September contains, among much interesting matter, notes on the Blackcap and Sparrow-hawk, on 'Black-eyed Susan'—(the Gannet variety from the Farnes, frequently referred to in *The Naturalist*); Grasshopper-warbler nesting in Lincolnshire, the Great Spotted Woodpecker in Cumberland, and the status of the Arctic Tern in Lancashire and the Farnes.

A certain Philosophical Society recently arranged with the Corporation in the same city to take over its museum. After several meetings it was decided to dissolve the old society, hand over its collections, and then form a new society, which would reap certain benefits from the Corporation. The old society was dissolved; terms were arranged with the Corporation; but the Philosophers forgot to form a new Society!

The death is announced of Sir William Edward Garforth, LL.D., of Snydale Hall, near Normanton. Sir William was well known throughout the coalfields of Great Britain, and to engineers and coalowners on the Continent, for his specialised knowledge of mining, his systematic application of science to the industry, and his successful experiments to ensure safe working underground. Throughout his career Sir William took a keen interest in mining education and research. He was chairman of the Mining Advisory Committee of the Leeds University, and was a member of the Committee for over forty years. He occupied many prominent positions on other bodies, including the presidential chair of the Yorkshire Geological Society.

The *Proceedings of the Liverpool Geological Society* for 1920-21 have recently been issued under the editorship of Mr. E. Montag. The papers include Mr. W. T. Walker's Presidential Address entitled 'Some Advances in Geological Science' ['The formation of minerals and rocks' in the 'contents.']. 'Microscopic Study of the Carboniferous Limestone in North Wales,' by T. A. Jones; 'Homoeomorphy in Ammonites,' by E. Neaverson; 'Certain Numeral Deposits in Stratified Rocks, with Special Reference to the Carboniferous and Trias,' by H. W. Greenwood; 'Excursion to Breiddens and Oswestry,' by E. D. Nicholson; and a useful 'List of papers, etc., on the Geology of the Country round Liverpool from 1910 to 1919' is contributed by W. Hewitt.

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NOTES AND COMMENTS.

SCIENTIFIC PUBLICATION.

On this subject, Dr. F. A. Bather has an article in *Nature* recently, from which we extract the following:—'Many of our scientific journals, especially those started in years of prosperity, are needlessly sumptuous. No journal need cut out matter so long as it allows a quarter of a page or more to the author's title and titles. The illustrations in these journals are often on an absurdly large scale, and there is too much printer's 'fat.' Footnotes are generally a sign of undigested matter and chaotic thought. Sensible and succinct methods of referring to literature are being adopted and enforced by modern editors, but there is room for improvement. Some authors have a habit of writing a separate paper on each aspect of a single subject; and three such papers may appear in one number of a journal, each with its quarter-page heading and half-page blank at the end. This habit is much in evidence in the modern journals to which I have referred. There are other authors who write slight variants of the same article for several periodicals. Since they are not paid for their trouble, they have no excuse for thus inflicting themselves on a weary public. Suppress them, Mr. Editor! The preliminary notice is frequently a form of this self-advertisement.'

DACTYLOGRAPHY AND PINE-APPLES.

We have received No. 1 of a new Journal entitled '*Dactylography*: a bi-monthly Journal dealing with Identification by Finger-prints and other methods, Detection of Crime by Scientific Means, etc.' (20 pages 1s.), published by Messrs. Webberley, Ltd., Hanley. The publication deals with 'Chemical Evidence in Criminal Trials,' by C. A. Mitchell; 'Social and Anti-Social Significance of Tattooing,' by W. D. Hambly; 'The Dawn of Dactylography,' by the Editor, and other subjects. The following paragraph taken from the Editorial Notes seems to indicate that the title *Dactylography*, covers a fairly wide area:—'Medical men often prescribe pine-apple for some forms of dyspepsia. We have not all lived like Colonel Altamont, in *Pendennis*, where "pigs were fed on pines," but invalids even of the poorer classes can now afford to get tinned pine-apple. A new variety, however, I find, has now come on the market. If pine-apple contains active pepsine, as it should do, it may be tested by its speedily curdling milk. Now this brand is tasteless, and is inert, so far as the milk test goes. I think the tissue is that of pine-apple. Has the pepsine then been extracted? It is still more certain that the fruit is genuine pine-apple when it is tinned in cross sections. But one can tell by the flavour, and by the milk curdling when mixed with the fruit or its juice.'

NOTTINGHAMSHIRE GYPSUM.

The Mineralogical Magazine for September contains W. A. Richardson's paper on 'The Micro-petrography of the rock-gypsum of Nottinghamshire,' which has already been referred to in these pages. He gives the following summary :— (1) Microscopic examination of rock-gypsum reveals a wide range of structure, and many metamorphic types are represented. In the nodular masses there seems to be a dependence of grain and structure on the size of the mass. (2) Anhydrite appears as cores only in very large nodules, and would appear to originate under physical conditions established when concretionary growth reached a certain stage. In the main seam, anhydrite is distributed without regard to the size and form of the bed, and in lamellae alternating with gypsum. (3) Microscopic evidence supports the view that the main seam, chiefly originated by sedimentary deposition, possibly modified by some segregation during deposition; and that the nodular types are concretionary in origin. (4) The metamorphic characters are secondary effects of pressure originating in the partial or complete hydration of the anhydrite.

QUARRYING 3,000 B.C.

Mr. S. McPherson, under the above title, has an article in *The Quarry* for October, in the course of which he says that Adam 'is said to have dug a cave before he even cut down—or tore down—a fig leaf with which to cover his nakedness.' Mr. McPherson goes on to say, 'What did he cut out the rock with? Even if he used one of the stone instruments which our forebears used in olden times for various useful purposes, such as clubbing their wives and so forth, he must have had something to make the stone tools with. Speaking of the weapons of the Stone Age, reminds me that recent investigations have proved that the Yorkshiremen of that age went outside the Ridings of Yorkshire for the flints with which to make their knives and axes, not, as a writer dryly puts it, to avoid the indelicacy of braining a neighbour with a chip of his own doorstep, but because the material was better.' Later on in his notes, Mr. McPherson adds, 'During the last two years a vast stone-axe factory was discovered in Penmaenmawr by Mr. S. Hazledine Warren, so we find that quarrying at Penmaenmawr took place no less than 5,000 years ago. Literally thousands of these axes were discovered in every stage of manufacture. Some were rough, resembling the earlier flint work of the palæolithic age; others were polished in the neolithic style. And the chief scientific interest of this great discovery of 1919-1920 lies in the fact that the stone used is not a flint, but a granite.' Unfortunately, Mr.

McPherson, the stone in question was not a granite, and neolithic Yorkshiremen did *not* go outside their county for their flint.

ROCK SALT AND BRINE.

With the above title Dr. R. L. Sherloch has written Vol. XVIII. of the Special Reports on the Mineral Resources of Great Britain, published by H.M. Geological Survey (123 pp., 5s. net). The book collects for the first time all that is known about the geology of salt in Great Britain. In Chapter III. there is an account of the structure of the Cheshire basin, and it is shown to be asymmetrical. The middle is further east than hitherto supposed (*i.e.* not at Northwich, but at Plumley, or further east still). The Cheshire Saltfield, instead of consisting of a few square miles round each of the salt towns, is a continuous area extending into Salop, and comparable in size with a coalfield such as that of South Lancashire. What has been supposed to be the end of the salt beds is sometimes merely a fault, and at other times is a deep channel filled with Drift. Every boring of which reliable information is obtainable is listed, with data. The salt-beds of Cheshire are correlated with those of Staffordshire, Lancashire, and Worcestershire. The Middlesbrough Salt is on a lower horizon. For Middlesbrough, horizontal sections are given, based on Marley's records which, though published in 1892, appear to have been hitherto ignored. There seems no reason for ascribing a Permian Age to the salt, and the evidence bears out the views the author published in 1912, namely, that the 'Permian' beds of North-east England are really a lithological facies of the Trias.

DR. T. W. WOODHEAD.

On the unanimous vote of the Executive Committee of the Yorkshire Naturalists' Union, T. W. Woodhead, Ph.D., M.Sc., was elected President of the Union for 1922. Dr. Woodhead has rendered great service to the Union in connection with his position as one of the secretaries for many years, and in his ecological studies he is in the forefront as a botanist. Dr. Woodhead's work in botanical survey is well known, and he is the author of many important botanical memoirs, and of a valuable volume on 'The Study of Plants,' published by the Oxford University Press.

THE SELBORNE SOCIETY.

The writer recently had the privilege of being present at a dinner at the Hotel Cecil, to celebrate the purchase of the Brent Valley Bird Sanctuary—a remarkable refuge of wild life lying just outside the bounds of London—as a Gilbert White memorial. Lord Grey, of Falloden, who presided, said never

under the most favourable conditions had he seen anything like the same number of birds and species of birds in so small a space. It was very remarkable in that small wood of nineteen acres forty-five different species of British birds had nested and bred. Thirty-seven other species had visited the wood and had not bred. Ten others had been observed. Thus ninety-two different species of birds had gone there in the spring, and more than half that number had nested. The use that could be made of the sanctuary was obvious. It could be made a place for Nature study. No one could really enjoy birds without learning their song, and the Bird Sanctuary provided, he believed, the best and most suitable opportunity for the purpose that could be found anywhere in the country. It was due, he believed, almost entirely to an anonymous donor that the site now occupied twenty-six acres. To that donor he would offer his tribute of gratitude for having rendered a very great service.

BIRD SONGS BY WIRELESS TELEPHONE.

A remarkable performance, however, was the transmission into the dining room of songs by the human voice, and also of birds—by wireless telephone. These were quite distinct, both by ear instruments and without, the songs being quite easily heard from a 'receiver' at the end of the room. The song of the nightingale was distinctly heard, and also that of a blackbird, but, to the writer, it sounded remarkably like a thrush, though it must be admitted that the song was given after dinner! We should like to congratulate the Selborne Society, and Mr. W. Mark Webb, on the occasion which caused the dinner to be held, viz., the completion of the purchase of the Brent Valley Sanctuary. Would that Spurn Point, Hornsea Mere, and other areas in Yorkshire could be secured for all time in a similar way!

A LOST LINCOLNSHIRE VILLAGE.

At the recent Annual Meeting of the Lincolnshire Naturalists' Union, Mr. H. Preston states that the recent visit of members to Frieston shore led to the consideration of a rather important problem in Lincolnshire coast geology. From a coaching bill dated 1821, which recently came into his possession, he had expected to find a good sandy shore. Instead was a long reach of mud flats, the tide receding as much as three miles from the bank. The bill stated that the new post coach, the British Queen, would commence running from Nottingham to Boston, and passing through Grantham, on Whit Monday, June 11th, 1821. The coach would make the journey on four days a week during the bathing and summer season. Stops would be made at Rodney and Hood. He had

rather expected from that bill to find a pleasant seaside resort with a good sand beach. The great stretch of mud flats, with a network of marine gullies, was somewhat of a surprise, and the crossing of the gullies proved no easy matter, owing to the very greasy nature of the ground. Eighty or a hundred years ago the Frieston shore was a clean, white, hard sand, quite suitable for sea bathing, and annual pony races were held there. Years ago the tide sometimes flowed up the River Witham with dangerous rapidity, so that a common shout used to be, 'Flood hoa ! Fly hoa ! The tide's a-coming higher.' Some time in the last century a new cut was made, connecting a higher reach of the Witham, so as to bring some of the water into other parts of the Wash, and also prevent, as far as possible, the danger from the rushing tides. Since the opening of this cut the silt brought down by the Witham and its tributaries had found a fresh area of deposit, and the silver sand beach of the Frieston shore had got covered up to such an extent that the land side of the bank was several feet lower than the water side, and many parts of the flats had risen within memory of living persons more than three feet.

DR. HENRY WOODWARD.

We regret to announce the death of an old friend, and one who has given encouragement to hundreds of geologists in this country, Dr. Henry Woodward, F.R.S., late keeper of Geology at the British Museum (Natural History). He was born at Norwich in 1832. In 1858, Owen appointed him to a junior post in the geological department of the British Museum. In 1880 he succeeded G. R. Waterhouse as Keeper of Geology. Soon afterwards the natural history collections were transferred from Bloomsbury to South Kensington, and on Woodward and his staff there fell the heavy work of removing the geological collection, and rearranging it in the new galleries. Under his direction the excellent series of diagrams and descriptive labels and the illustrated guide-books, which make the collection useful to the general public and scientific visitors, were devised and carried out. Woodward also superintended the preparation and publication of twenty-eight volumes of the technical catalogue of fossils. He retired from the Keepership in 1901, even at that date his appointment having been extended beyond the usual age-limit, and by sanction of the Treasury he was employed on special duties at the Museum for a further term of three years. On his final retirement in 1904, he had served in the Museum for forty-six years.

THE GEOLOGICAL MAGAZINE.

In 1864 Woodward became editor of the monthly *Geological Magazine*, work which he continued till his death. Under his

care the magazine increased in circulation and importance, and there are few English geologists who have not contributed to it under his firm and friendly rule. As an editor he was minutely exact in supervising text and illustrations, and the experience he had gained in the routine of office work enabled him to conduct the business side of the undertaking with a success not often associated with scientific journals.

HONOURS.

Many honours justly accrued to him. In 1873 he became a Fellow of the Royal Society; he was an Hon. LL.D. of St. Andrews, Murchison Medallist and President of the Geological Society, President of the Geological Section of the British Association at Manchester in 1887, one of the founders and first President of the Malacological Society, President of the Palæontographical Society, and of the Royal Microscopical Society, and Vice-President of the Zoological Society, in whose affairs he took an active share for many years.



Sir Edward Allerton Brotherton, Bart., has given £20,000 to the Leeds University for the development of bacteriological research.

It is reported in the daily press that, when deerstalking on the Dunrobin Castle estate of the Duke of Sutherland, Lord Desborough killed his 1,000th stag.

The Earl of Ducie, whose death is recently announced, was not only the 'father of the House of Lords,' but also the father of the Geological Society of London, being the senior Fellow at his death.

In mid-October a fisherman at Bridlington, while fishing with hook and line in the bay, caught a seal weighing between three and four stones. The seal had swallowed a whiting which had been hooked.

We should like to refer our botanical friends to a valuable paper on 'Plant nomenclature: some suggestions,' in No. 702 of *The Journal of Botany*. One good suggestion is that 'all trivials should be spelt with a small initial letter.'

Among the numerous valuable natural history publications in the *Bergens Museum Aarbok*, 1918-19, recently to hand, are 'Notes on *Luvarus imperialis* Rap., a Fish New to the Fauna of Norway,' by Sigurd Johnsen. We should like to congratulate the author on his excellent English.

We have received a well prepared 'Annual Report of the Gresham's School Natural History Society' (14 pp.), which reflects on the enthusiasm of the scholars at Gresham's, in the way of Natural History. This appears to be the Third Report of this Society, and certainly its publication is justified, and will probably greatly benefit the members.

The Botanical Society and Exchange Club of the British Isles has issued its Report for 1920, by the Secretary, G. C. Druce (Vol. VI., pt. 1, pp. 1-208, 10/-), and also its Report for 1920 of the Botanical Exchange Club, by G. C. Brown (Vol. VI., Pt. 2, pp. 209-259, 5/-). These publications cannot be ignored by students of the English flora.

Costermongers and others are warned by public notices in Middlesex that it is now an offence to sell plants or roots attacked by *Eriosoma lavigerum* Hausm., *Nygmia Phaeorrhoea* Dan., *Euproctis chrysorrhoea*, *Leptobyrssa Stephanitis rhododendri* Horv., *Spherotheca morsuæ*, *Synchytrium endobioticum*. We wonder what the coster's names for these diseases are!





BRONZE AGE WEAPONS IN THE SCARBOROUGH MUSEUM.*

T. SHEPPARD, M.SC., F.G.S.

PLATES II. AND III.

At the request of the Scarborough Philosophical Society, I have pleasure in describing the interesting and fairly representative series of weapons of the Bronze Age in the Society's possession. The Scarborough district has produced typical examples of various forms of Bronze Age weapons, and in recent years (see *The Naturalist*, May 1917, September 1917, and September 1918,) quite a substantial hoard of bronze axes has been discovered on the cliffs near the town. While the Scarborough Museum possesses a couple of socketed axes from this recent find, it is more than possible that one of the palstaves, if not indeed more examples, were originally part of this hoard, as, of course, the wasting of the cliff has always been gradually going on. Most of this hoard (twenty-four pieces) is in the Hull Museum.

(1) The principal object in the Scarborough series is a fine sword, which bears a label, 'found near Scarborough, 1864, purchased by the Society.' †

The sword is a remarkably fine example, and much longer than the usual type of Bronze Age swords found in E. Yorkshire. It is slightly bent at the point, and the greater part of the handle has been broken off and lost. A very similar handle to what would have existed when complete occurred in the Scarborough hoard, and is shown as No. 15, on Plate III. of *The Naturalist* for September 1917. The weapon is exceptionally well made and beautifully designed, the remarkably sharp cutting edge being obtained by the part near the edge being slightly drawn down so as to form a shallow fluting. This cutting edge is $\frac{1}{8}$ " wide all round, and, except for half an inch on one side in the middle of the sword, is intact. Near the handle the edge of the blade has been cut away, forming two slight notches, the object being probably to save the hand from being cut by the sword being drawn back by the warrior, there being apparently no transverse guard (see Evans, "Ancient Bronze Implements of Great Britain," page 278). In general shape and appearance this Scarborough sword resembles the example from Newcastle (Evans, *tom cit*,

* For a description of the Bronze Implements in the Doncaster Museum, see *The Naturalist* for July, 1918, pp. 219-223; those in the Whitby Museum, see *The Naturalist* for February, 1918, pp. 59-61. Descriptions of other Museum collections are in preparation.

† I can find no reference to the purchase of this sword in any of the Society's Reports.

page 281), which was found in the Tyne, and was formerly in the possession of Canon Greenwell. In that instance, however, there are two rivet holes on each side of the blade as a means of fastening a handle of wood, bone, or other material, whereas in the Scarborough example there are three rivet holes on each side, in one of which a bronze rivet still remains. This is $\frac{1}{2}$ " in length and about $\frac{1}{8}$ " in diameter, and made from a cylindrical piece of bronze. The portion of the sword remaining measures 24" in length, so that when complete it would probably be about 28 inches. Its width in the middle is $1\frac{1}{4}$ ", across the broad part; near the handle, $2\frac{1}{2}$ "; it is lenticular in section, and $\frac{5}{8}$ " in thickness. Weight 26 oz.

There are one or two features in connexion with the sword worthy of comment. Some small pittings, resembling the familiar 'worm holes,' in old timber, are particularly numerous on one side of the blade, and a few occur on the opposite side; presumably they represent bubbles of air which occurred in the molten bronze when the blade was being cast. There are also distinct evidences of the sword being in at least four sections, as there are definite lines across the blade which in two cases clearly break the continuity of the cutting edge, at first giving the weapon the appearance of having been cast in a mould made up in separate parts and fastened together. Beginning at the point of the first dividing line is $1\frac{1}{4}$ " down, the next section is 3" in length, and the next $7\frac{1}{2}$ ", the remainder of the sword, including the handle, is without a break.

The way in which these pieces have been welded together is so excellent that at first I was inclined to the opinion that the breaks were evidences of fractures in the mould in which the weapon was cast. There were practical difficulties in the way of this, however. I took the opportunity of examining the fine collections in the British and London Museums, but found nothing quite like it. In the Castle Museum at Newcastle, however, is a precisely similar sword, which has a mark about $1\frac{1}{2}$ " from the top, exactly like that on the Scarborough example. In both swords the marks of the weldings are perfectly straight, as though made by a fine band-saw; and the edge shows no sign of any portion of the weapon being missing. It seems difficult to understand how the parts of the blade could have been severed without bending the bronze at the joint.

On the suggestion of Mr. Reginald Smith, of the British Museum, I submitted the weapon to Mr. Brewis, of Newcastle, who states that these swords were usually cast in sand, and, therefore, breaks in the mould could hardly have occurred; further, that he was satisfied that in the Scarborough case the marks were due to welding in quite recent times. Possibly

this had occurred just before the weapon was sold to the Scarborough Society, as I understand at that time the late Canon Greenwell and others were able to get repairs of this sort carried out with hardly any effect upon the patina.

However, possibly as a result of the usual postal methods, on the return of the sword from Mr. Brewis, the bend which existed when forwarded, was almost straightened, and during this process the welding was distinctly shown by the widening of one of the joints; and further, the severed portions had been firmly held together by a screw inserted in the centre of each.

The sword, as in the case of the two Newcastle examples already referred to, is of the late Bronze Age or early Iron Age period (Halstadt).

(2) This a very delicate and well-made rapier, something after the same style as the implement in the Doncaster Museum (see *The Naturalist*, 1918, fig. 1, Plate IV.), though the Scarborough example is much finer in workmanship. It bears a label to the effect that it was 'found nr. Flotmanby.' An almost precisely similar implement, both in shape and size, found in the Thames, is figured by Evans (*tom cit*, p. 249). In this case, in lieu of the usual rivet holes for attachment to the handle, are two notches, one at each side of the base, which would, no doubt, enable the blade to be steadied by rivets. The specimen is very bayonet-like in its method of construction, it has a broad central rib, from which the edges proceed, and these have the appearance of hollow-ground razors. At the broadest part of the blade, about the point to which the handle would extend, are two very fine spurs or projections.

The specimen is $10\frac{2}{5}$ " long, $\frac{1}{5}$ " wide in the middle, $1\frac{2}{5}$ " at its greatest width, and about $\frac{1}{8}$ " in thickness. Weight 4 oz.

(3) There are half a dozen palstaves of interesting design, and of varying type. One is on a card together with another palstave, and the card bears a label, 'bronze celt found in Scalby Beck near Scarboro.' This label may refer to either of the axes attached to the card, to both, or to neither. At any rate we can take it that this celt is from the Scarborough district. The first (No. 3) is of the flat variety, has a sharpened cutting edge carefully worked, and has only very slight side ridges, and the merest suggestion of a central depression for receiving the half of the split wood shaft. This celt represents almost the first stage in the evolution of the plain flat axe which was made in imitation of the stone axe. A very similar example, though possibly even slightly more primitive, is shown on fig. 21, Plate 4, of *The Naturalist* for 1917, this being from Bridlington. Both examples are suggestive of the type of axe found in Ireland. The Scar-

borough specimen is very slightly damaged by being broken at the end opposite to the cutting edge. It measures 4" in length, 1" across the middle, $\frac{5}{8}$ " in thickness, the cutting edge being 3" in length. The axe contains a few pittings on its surface, which probably occurred since its burial in the ground. Weight 9 oz.

(4) What is probably the next in age of this series, is a rather unusual type for this district, which is labelled 'bronze celt found at Kirby Wisk, presented by Mr. Jacobs, January 12th, 1831.' The specimen is corroded rather badly, suggesting its close proximity to peaty water, but its outstanding features are the exceptionally large leaf-shaped 'wings,' which occupy nearly two-thirds of the length of the axe. Between these extensive wings, of course, the split shaft would be inserted.

The specimen is 5" long, $1\frac{1}{2}$ " wide at the base of the wings, the wings are $1\frac{1}{8}$ " wide at the widest part. The cutting edge, when complete, would be $3\frac{1}{2}$ " long. Weight $12\frac{1}{2}$ oz.

(5) This is a well made celt, and appears to be practically in the condition in which it was cast, and shows no signs of having been used at all. This is very much after the type of axe from the Hotham hoard, figured in this journal recently (July, 1921, plate I.), and it is almost identical with the Ripon example (*The Naturalist*, 1917, fig. 23, plate IV.). Evans figured nothing quite like this. The specimen is $5\frac{1}{4}$ " long, has two well-formed lozenge-shaped wings nearly $1\frac{2}{3}$ " across, the extremities of the wings at each side being slightly turned in, so as to form a better grip for the split shaft. At the base of the wings there is just a suspicion of a ridge to stop the shaft. The cutting edge is 3" long. Weight 12 oz. If this axe was originally part of the Scalby hoard, as might be assumed from the label, it is probably one of those for the manufacture of which the collection of broken spears, swords, etc., was intended.

(6)* This is somewhat similar in type to the last, but is nothing like of such excellent workmanship. It bears a label, 'River Humber,' from which it has apparently been found somewhere in the Humber district, but whether north or south it is now difficult to say. The wings are narrower and smaller ($\frac{7}{8}$ " wide) than in No. 5. The depression for the split shaft is rather deeper; the cutting edge is clumsily made, and has not been fully hammered out. There is just a suspicion of a U-shaped ornament or decoration on each side at the base of the wings, as may be seen, though more

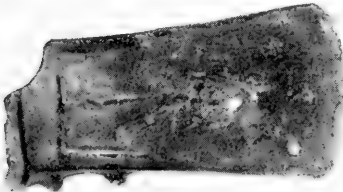
* No. 6 bears a large number '220,' such as are used at auction sales, and may indicate that it was purchased at a sale. No. 7 has a similar label, numbered '221.'



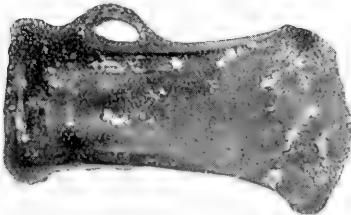
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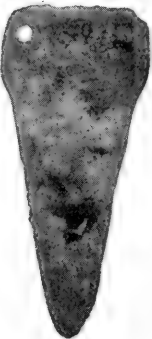
10



15a



16



15



pronounced, in the Ripon illustration already referred to ; a decoration more accentuated, and of a different form, occurs in the next example.

The specimen is $4\frac{3}{4}$ " long, $\frac{4}{5}$ " wide at base of wings. The cutting edge is 2" across, and the weight $8\frac{1}{2}$ ozs.

(7) This is a much corroded axe of small size, and has probably been in peaty water. It has evidently had 'wings,' but these, with the top part of the implement, have been eaten away by the acids. It is remarkable for the enormous flat ridge for stopping the shaft, at the bottom of each of the two sockets. The decoration on each side of this axe gives these the appearance of brackets. In addition to a deep triangular groove on each side of the stop, there is below a longer V-shaped ridge which reaches within half an inch of the cutting edge. This double V-shaped decoration is rather unusual in Yorkshire examples. The specimen is $3\frac{5}{8}$ " long, $\frac{7}{8}$ " wide, $1\frac{1}{8}$ " in thickness (measured in the middle of the wings), and the cutting edge is $1\frac{3}{4}$ " long. Weight 5 oz.

(8) This, and the next example (9) are very similar in general design. No. 8 has fairly large wings, bent over on each side, and meeting rather more than in No. 5 described above. There is also a very slight ridge or stop for the split shaft, and the axe has the unusual feature for a non-looped palstave in having a distinct medial ridge, which extends from the stop just at the base of the wings, to within about an inch of the cutting edge, where it gradually disappears. The sharp-pointed corners of the cutting edge of the axe have been hammered down at some time, a feature also present in No. 9, and in the latter the hammering is distinctly old in date. The measurements of No. 8 are : length $6\frac{2}{3}$ ", width across the wings (which are lanceolate rather than lozenge-shaped), $1\frac{2}{5}$ ", cutting edge $2\frac{1}{5}$ "; (originally probably half an inch longer). Weight 16 oz. This celt is labelled 'bronze celt found nr Knapton formerly a Roman Station.'

(9) A smaller edition of the last example, in which the wings are bent over towards meeting each other even more, and almost forming a socket on each side of the axe. There is a very slight ridge or stop, and there has been a medial ridge as in the last example. This can be distinctly felt, but is not very obvious to the eye. The pointed extremities have been rounded off by hammering, a feature which is not recent. The specimen is slightly corroded by peaty acids. The card bears on the back the words, 'Bronze Celt, Presented by Mr. Hanson Herbert.' Possibly this information may sometime enable the locality to be ascertained.

Length $5\frac{1}{4}$ ", width across wings $1\frac{1}{4}$ ", cutting edge $1\frac{3}{4}$ ". Weight 10 ozs.

There are five more or less perfect socketed axes of the

usual type, two of which, at least (Nos. 10 and 11), are probably part of the Scalby hoard.

(10) This is the usual type of socketed axe just as it came from the mould, the cutting edge not having been hammered out. The ridges in the middle, formed by the valves, are very prominent, and inside the axe for securing the shaft are two unusually pronounced ridges, from top to bottom, one on each side. There is a collar extending about $\frac{1}{2}$ " from the top, and the usual three raised ridges on each side, which extend about half way down the axe. Measurements: $3\frac{1}{4}$ " long, cutting edge $1\frac{1}{10}$ " across the socket (which is square, with round corners), $1\frac{1}{2}$ " by $1\frac{1}{2}$ ". Weight 7 oz., which is more than usual for an axe of this kind.

(11) This is quite typical of the Scalby hoard, though the cutting edge has been hammered out rather more than usual for a Scalby axe, and from one side, more than half of the weapon has been broken away. On the inside of the upper portion is a ridge which, however, does not extend from the top to the bottom. There is a collar similar to the last, and originally the axe had the usual three decorative ridges extending not quite half way down, but the central ridge has been worn away, and the side ones are nearly obliterated. The mould ridge is prominent. Measurements: $3\frac{1}{4}$ " in length; across the socket $1\frac{5}{8}$ ", length of cutting edge 2" (as one corner is broken away, it would originally be quite $2\frac{1}{2}$ "). Weight 5 oz.

(12) Another broken axe, about half of one side and the loop being missing. This is as taken from the mould, the cutting edge not having been hammered out, and is much chipped and broken, as in No. 10, which it much resembles. There are pronounced ridges inside, extending the whole length of the axe; outwardly it has the usual collar with three ridges extending nearly half way down the sides. The ridges on the sides formed by the mould have been filed away. Fastened to the axe is a fragment of a very old label, which appears to contain the words 'brass (axe?) . . . the foot of the Wolds nr . . .'). If my reading of the label is correct it would seem that this is not a Scalby example. Measurements: $3\frac{3}{4}$ " in length, by $1\frac{3}{4}$ " along the cutting edge. As only a portion of the socket remains, measurements cannot be given, but they will resemble those of the preceding axe. Weight 6 oz.

(13) The upper portion of a particularly long and thin socketed axe, very similar in type to figures 11 and 12 from the Scalby hoard, on Plate III. of *The Naturalist* for May, 1917. Near the handle is an irregular hole, $\frac{1}{2}$ " across, due to a flaw in the casting, which has probably resulted in the specimen having been broken into two for re-melting. The process has evidently been a tedious one, judging from the

numerous blows which the specimen has taken before it finally divided. The lower half of an axe (No. 18 on the Plate referred to), might almost be the remaining portion of this axe. The measurements of this fragment are $2\frac{1}{8}$ " in length, by 1" in breadth at the break. The socket, which was originally oval, but has one side now flattened due to hammering, measures $1\frac{1}{2}$ " by $1\frac{1}{4}$ ". Weight $3\frac{1}{2}$ oz.

Adhering to the specimen is a portion of a label in the same handwriting as that on No. 12, but I am not able to decipher it.

(14) I hesitate to describe this particular example as a forgery, as it is so excellently made, and if a forgery, is so well done, even to the inner ridges, that it would almost seem that it had been cast in an original mould for one of these axes. The specimen has a lack of old patina, bears evidence of considerable filing (an unusual feature) on its surfaces, and in other ways resemble some of the Flint Jack forgeries in the Mortimer Collection, though I must admit these are all much more clumsy than the present example.

On the other hand if genuine it must have been accidentally burnt or treated in some other way to give it its present suspicious appearance. There appears to be no data attached to this specimen, and while I do not care definitely to state that it is a forgery, I must look upon it with suspicion until further information is forthcoming. All I can at present say is, that if it is a 'fake,' then it is the best I have ever seen. Measurements: $3\frac{1}{8}$ " long, cutting edge $1\frac{3}{4}$ ", the square socket $1\frac{5}{8}$ " by $1\frac{1}{2}$ ". Weight $7\frac{1}{2}$ oz.

(15) Perhaps the most interesting Bronze Age relic in the Museum is the very thin triangular dagger blade, found together with a bone pommel in the tumulus at Gristhorpe, in 1834, by the late Professor Williamson, who, as a young man, opened this large burial mound, and published one of the finest descriptions of a British tumulus ever written, of which editions* have been published from time to time by the Scarborough Society. The bronze dagger-blade (fig. 15) has several features of interest. It is very thin indeed, and is much corroded, due to its long burial in the earth. It is roughly triangular in shape, $3\frac{1}{4}$ " in length and $1\frac{1}{2}$ " in width. It is very thin, being no thicker than an ordinary well-used dinner-knife blade. It was attached to the handle by two rivets (an unusual number), one of which still remains in place.† This is cylindrical, $\frac{3}{16}$ " in length, by $\frac{1}{8}$ " in width. Weight $\frac{1}{4}$ oz.

A somewhat similar example with a bone pommel was

* Third edition, 23 pp. and plates, published in 1872.

† Both were present when discovered, (see Williamson's 'Description,' 3rd ed., p. 13).

found at Garrowby Wold, accompanying a Bronze-Age burial, and is figured in Mortimer's 'Forty Years Researches,' fig. 391. The British Museum possesses a blade even more like the Gristhorpe example, which, accompanied by a bone pommel, was found in a barrow at Helperthorpe in the East Riding. It is figured on page 83 in the 'Guide to the Antiquities of the Bronze Age,' second edition, 1920. In this case, as with the Gristhorpe example, two rivets were used for fastening the blade to the handle. A very similar pommel to the Gristhorpe example, with two rivet holes, from Garton, E. Yorks., is illustrated by Evans, *tom. cit.* (fig. 282).

(15a) This remarkably well preserved pommel is evidently made from a bone of a cetacean, a fact pointed out by Dr. Smith Woodward, of the British Museum of Natural History, to whom I submitted the specimen, and indicates that probably a stranded whale on the beach provided Bronze Age man with material for his dagger handles. Owing to the treatment given by Williamson, the specimen is almost in as good condition as when new, and shows the file-like marks and method of construction quite well. It is 2" by $\frac{7}{8}$ " across; the bottom being smooth and polished, and gradually contracts cone-wise to an oval $1\frac{1}{2}$ " by $\frac{1}{2}$ ", the pommel being $\frac{1}{2}$ " deep.

It is interesting to observe the way in which the hollow for the reception of the handle has been made in this pommel. It has been bored out by a drill about $\frac{1}{12}$ " in diameter, which has been inserted in no fewer than 15 different places (two of which have evidently gone almost to the bottom) which then enabled the central hollow, measuring $\frac{7}{8}$ " by $\frac{1}{4}$ " by $\frac{2}{5}$ " deep, to be chipped out. Three holes were drilled through each side to enable the centre piece to be firmly attached to the handle. These are rather larger than the drill warranted, and are consequently irregular in shape, as the smaller drill had evidently also to prepare these larger rivet holes. The circular holes distinctly exhibit numerous miniature rings as a result of the drilling.

(16) This spear-head has been broken in two, and at some comparatively recent period, probably since it came into the Society's possession, the two halves have been soldered together, a process which has rather shortened the spear-head and interfered with its lines, in addition to which one of the rivet holes is made to appear too near its neighbour, instead of being opposite. Otherwise the specimen is a well-made socketed spear-head of lanceolate form, and from the old label inserted in the socket, it is evidently 'from the Wolds.' The spear is based upon a large conical socket for the shaft, $4\frac{7}{8}$ " in length, on the sides of which, for a length of $3\frac{1}{8}$ ", are two small knife-like projections forming the spear. These are not

quite similar in shape, but this irregularity might be due to subsequent sharpening rather than to a defect in the original mould for casting. The spear-head is a little broader and not so pointed as the usual type of East Yorkshire bronze spears, more resembling the Finningley example (Fig. 16, plate VI., of *The Naturalist* for 1918), now in the Doncaster Museum. The circular socket extends to within $\frac{1}{2}$ " of the point, and at a distance of $\frac{3}{4}$ " from the bottom two holes are bored through, evidently to take a rivet for securing shafting, but these holes have suffered somewhat from the repairs already alluded to. The socket, which is $2\frac{1}{8}$ " across, has a distinct groove and ridge around the edge in the way of ornamentation. Weight 2 oz.

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The Seventeenth Report of the Southport Society of Natural Science continues the record of the list of the Society's lectures and meetings from 1913 to 1921.

'The Wonders of Geology' is the title of a course of twelve lectures being delivered in connection with the British Museum (Natural History) by Dr. J. D. Falconer, a syllabus of which can be had on application at the Museum.

A fifth edition of a small pamphlet 'What to see in the Leicester Museum and Art Gallery,' by E. E. Lowe, (16 pp., 1d.) has been called for, and we understand over 2000 copies have been sold between August Bank Holiday and October.

The death is announced of Benjamin Harrison of Ightham in Kent, whose work among the 'eoliths' (a name given to flints supposed to be the tools or weapons of man in pre-palæolithic days), is well known to all archæologists. Mr. Harrison was a grocer.

From Dr. Henry Fairfield Osborn we have received a voluminous *Fifty-Second Annual Report of the American Museum of Natural History* (265 pp.), which is well illustrated, and demonstrates the numerous and many-sided activities of this important Museum.

We have just received Vol. XXXV., Part 9, and Vol. XXXVI., Part 5, of the *Transactions of the Manchester Geological and Mining Society*, each containing the contents and index of the particular volume of this publication, which unfortunately ceased in 1919.

We learn from the press that the Windsor Museum, which contained many interesting local geological and archæological specimens, has been purchased by the Hull Corporation. It seems a pity that the collection could not have been kept a little nearer its original home.

The Report for 1920-1921 of "The National Trust for Places of Historic Interest and Natural Beauty" (60 pages) illustrates the many activities of this valuable Association, which at the present moment is making an effort to secure the famous Cissbury Camp in Sussex.

The Fisheries Department of the Ministry of Agriculture and Fisheries has published 'Sea Fisheries.—Statistical Tables, 1919-1920. (In lieu of Part 2 of the Sea Fisheries Report for the same period).' (94 pp., 6/-). The figures quoted relating to the various species should prove of considerable scientific and economical value.

A useful pamphlet entitled 'Geological Itineraries in Anglesey,' by Dr. Edward Greenly (12 pp.) has been prepared, and will be found to be a good guide to students and others visiting that Island. It is on sale at 7d. per copy or 6/- per dozen, post free, from the Secretary of the Liverpool Geological Society, Mr. T. A. Jones, 27 Rockfield Road, Anfield, Liverpool.

FIELD NOTES.

Barbastelle Bats at Helmsley.—In my notes on Yorkshire Bats (*ante* p. 362), the length from the thumb joint or wrist to the tip of the wing in the adult female should have been $2\frac{13}{16}$ ins., and not 2 ins. as given.—H. B. BOOTH.

Whiskered Bats near Appleby.—In August, Mr. F. H. Edmondson brought a small bat, which proved to be a female Whiskered Bat, *Myotis mystacinus*. He informed me that it was one of about forty that flew out of a hole in a tree near to Appleby. By the size of the mammæ it was evident that it had recently been suckling young.—H. B. BOOTH, Ben Rhydding.

Great Crested Grebe and Little Owls nesting near Fairburn.—Three pairs of Great Crested Grebes have nested here this year, but owing to unknown causes only two young, one in a family, have been reared. They seem to have nested here for a few years now. I have also heard that the Little Owl nested at Ledsham a few miles from this village. I did not hear of it until the young left, but I think the report is reliable.—W. G. BRAMLEY.

Strongylocoris luridus Fall. in Cumberland.—On the 9th of July, I captured a single specimen of this extremely rare insect by sweeping along a hedge bank in an unfrequented lane near Prior Rigg, about three miles west of Carlisle. On setting it, I was struck with the resemblance in size and shape to *S. leucocephalus* Linn., and thought it might be a form of that species. On turning to Saunders' 'Hemiptera-Heteroptera,' it agreed with the description of *S. luridus* Fall., so I sent it to Mr. E. A. Butler, and have now received his confirmation. Saunders only gives three British localities, all on the South Coast. Mr. Butler writes: 'Besides the British record from *Jasione*, there are continental ones from *Galium* and *Calluna*. It occurs from Southern Scandinavia to Northern and Central Italy, and eastward to the Caucasus, but is certainly rare in Britain.' I have taken *S. leucocephalus* not uncommonly some years in the same locality, and *Galium aperine* is one of the dominant plants along the hedge.—JAS. MURRAY, 2 Balfour Road, Carlisle.

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We have been favoured by Lord Sudeley with a reprint of his interesting paper on 'The Public Utility of Museums,' which appeared in *The Nineteenth Century and After* for July, and in the same pamphlet is a reprint of a leading article in *The Times* on the subject of guide lecturers, and of a letter from Sir David Murray, dealing with the value of public lectures in the National Gallery. The public are greatly indebted to Lord Sudeley for the enthusiastic way in which he has constantly advocated the popularising of Museums.

THE VALIDITY OF THE NAMES—*TESTACELLA* *MAUGEI* FÉR. AND *T. HALIOTIDEA* DRAP.

HUGH WATSON, M.A.

MESSRS. A. S. Kennard and B. B. Woodward have recently maintained (*Proc. Malac. Soc.*, Vol. XIV., 1920, pp. 77-80) that the specific names usually applied to two of the three British species of carnivorous slugs are invalid, and the name *Testacella maugei* Fér. ought to be replaced by *T. haliotoides* Lam., and that of *T. haliotideia* Drap. by *T. europæa* Roissy. It is evident that these changes will introduce great confusion into our nomenclature, for the names *T. maugei* Fér. and *T. haliotideia* Drap. have both been employed for more than a hundred years, and to change them, as suggested, will certainly be troublesome, especially in view of the similarity between the names *T. haliotideia* Drap. and *T. haliotoides* Lam. The following notes show, however, that even the priority purist should hesitate before accepting either of these changes.

Let us first consider the case of *Testacella maugei* Fér.

The earliest description of the genus *Testacella* was published in 1801 by Lamarck (*Syst. Anim. s. Vert.*, p. 96), who adopted the generic name proposed by Cuvier in the previous year (*Leçons d'Anat. Comp.*, Vol. I., table V.), and cited 'Favanne, pl. 76, *Limaces à coquilles*.' Lamarck also gave as an example of this genus, '*Testacella haliotoides* n. ex D. Mager, ex ins. Teneriffæ.' Now Jac. de Favanne, on pl. LXXVI. of the third edition of Desallier d'Argenville's '*Conchyliologie*,' depicts three species of '*Limaces à coquilles*,' which he and his son describe on p. 429 of Vol. I. of the same work. They say that they owe the first species to M. de La Faille, of La Rochelle, who had shown them the animal itself. The source of the second species is not stated. The third, of which the authors had apparently only seen a figure, is supposed to be a native of the Maldivé Islands. These last two species were named *Testacella costata* and *T. cornina* respectively by Bosc (*Hist. Nat. Coquilles*, Vol. III., 1802, p. 240); but in 1819 Férussac placed them in a separate genus, which he named *Plectrophorus* (*Hist. Nat. Moll.*, Vol. II., pp. 84-88). Their peculiar characters are probably partly mythical. The first species of Favanne, however, is evidently founded on the specimen preserved in spirit, which Férussac states was sent to Favanne in 1774 by de La Faille, who attributed the slug's discovery to Guillemeau, a physician at Niort, twenty-five miles inland from La Rochelle. This species was a true *Testacella*, Férussac stating, on the testimony

of Favanne himself, that it was the common species of France, that is to say, the form usually known as *T. haliotide*a Drap., and a study of Favanne's figures tends to confirm this conclusion. On the other hand, there can be little doubt that the Teneriffe species, 'ex D. Mauger,' for which Lamarck suggested the name *haliotoides*, is the one that Férussac named *T. maugei*, the only species known to occur in the Island of Teneriffe. It thus differs from all of Favanne's 'Limaces à Coquilles,' which Lamarck also indicated as belonging to his genus.

It is thus clear that the genus *Testacella* was established by Lamarck for more than one species. The fact that he only names a single example of the genus is no evidence to the contrary, for it was his usual custom only to mention one example of each genus described in his 'Système des Animaux sans Vertèbres,' however many species it might contain. But it was also Lamarck's custom to cite after the name of each example any figures of that species he knew of, which had been published; and as he does not cite any of Favanne's figures after his example of *Testacella*, but only refers to them in connexion with his generic description, it seems probable that he realised that the members of the genus depicted by Favanne differed from Maugé's species. Now, when a genus is established for more than one original species, it cannot be reasonably maintained that the generic description will suffice instead of a specific description of any one example of that genus; for obviously the generic description should apply equally to all the species included therein. Therefore, since Lamarck gave no specific description or figure of his *T. haliotoides*, his name is rightly regarded as a *nomen nudum*.

The name *Testacella haliotoides* was next used by Bosc in 1802 (*Hist. Nat. Coquilles*, Vol. III., p. 240), and de Roissy in 1805 (*Hist. Nat. Moll.*, Vol. V., p. 253), but both these authors applied this name to Favanne's first species, which, as we have seen, is the form known as *T. haliotide*a Drap., the commonest species in France. Their figures and descriptions seem to be based entirely on those of Favanne, whose work they cite. Yet both writers erroneously believed that this was the species which Maugé found in Teneriffe, and de Roissy even proposed another name for the French form.

In 1807 Férussac (*Essai méthod Conchyl*, p. 41) fell into the same error as Bosc and de Roissy. But in 1819 he frankly admitted his mistake (*Hist. Nat. Moll.*, Vol. II., p. 90), and realised that the Teneriffe species had never yet been described or figured—for Ledru's '*Testacula haliotoides*' (*Voy. Iles Tencriffes, La Trinité*, etc., Vol. I., 1810, p. 187) is a *nomen nudum*. Accordingly Férussac then gave the first description and figures of the species found in Teneriffe (*Hist. Nat. Moll.*,

Vol. II., pp. 94, 95, pl. VIII., figs. 10-12), and named it *T. maugei*, wisely preferring to name the species after its discoverer instead of adopting the name '*haliotoides*,' which was not only inconveniently similar to '*haliotide*a,' but had been erroneously applied first to one species and then to another. Férussac's name would, therefore, appear quite valid, and it has been accepted by nearly all the writers who have dealt with this species.*

The case of *Testacella haliotide*a Drap. is more simple.

In 1801 Draparnaud described the common French species of *Testacella*, and named it *T. haliotide*a (*Tabl. Moll. France*, pp. 99, 100), no specific name having previously been given to this form. There can be no doubt whatever that Draparnaud's species was that which is still commonly known as *T. haliotide*a. In the first place, his original description agrees best with this species. Secondly, Draparnaud described his species from specimens sent to him by M. Faure-Biguet, who not only himself published a description and figures of the slug (*Bull. Sci. Soc. Philom. Paris*, 1802, p. 98, pl. V., figs. A-D), but also sent specimens to Cuvier, who dissected them, and figured their internal anatomy as well as their external characters (*Ann. Mus. Hist. Nat. Paris*, Vol. V., pl. XXIX., figs. 6-11). Cuvier's excellent figures, as Kennard and Woodward remark, 'leave no doubt as to the species with which he was dealing.' Thirdly, Draparnaud stated that his *T. haliotide*a occurred both in the North and in the South of France (*Tabl. Moll. France*, p. 100), and the specimens that Faure-Biguet sent to him were found in the neighbourhood of Crest, in the Department of Drôme (*Hist. Moll. France*, Notes by the Editor on p. 152). *Testacella maugei*, on the other hand, is only found in the extreme West of France, and it was not known to occur even there until many years afterwards, Moquin-Tandon, so late as 1856, refusing to believe that it was indigenous to the country (*Moll. terr. et fluv. de la France*, Vol. II., p. 41); and Draparnaud himself makes it quite clear that he regarded Mauge's species from Teneriffe as purely exotic, although he fell into the same error as Bosc and de Roissy about Favanne's figures.

Kennard and Woodward, however, maintain that Draparnaud's name, 'being a homonym of Lamarck's, cannot stand.' Now we have already seen that there are good reasons for regarding Lamarck's name as a *nomen nudum*. And, even if it were not so, *T. haliotide*a Drap. should not be rejected as a homonym of *T. haliotoides* Lam. according to the recommendations enunciated under Article 36 of the International

* For a list of the principal references to this species see *Ann. Natal Mus.*, Vol. III., 1915, pp. 256-258.

Rules of Zoological Nomenclature, where we read that 'words derived from the same radical and differing from each other only in termination or by a simple change in spelling' are not to be rejected on this account, if once introduced. It is therefore evident that the name *haliotidea* Drap. is, in any case, perfectly valid for the species to which that name has usually been applied; and that all later names, such as *T. europæa* Roissy, given to the same species, should be rejected as synonyms, according to the International Rules.

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The Board of Agriculture and Fisheries Leaflet, No. 578, deals with Beeswax.

The Manchester Museum recently celebrated its 100th birthday, and an account of the history of this Institution, by Dr. W. M. Tattersall, appears in *The Museums Journal* for November. W. C. Williamson, formerly of the Scarborough Museum, was the first paid Curator at Manchester.

On account of the cost of postage, *The Lancashire and Cheshire Naturalist* is to appear bi-monthly in future. The July-August number, published on October 11th, contains 'Lepidoptera,' by J. C. Melvill; 'Mammalia,' by G. Bolam; 'Vertebrata,' and 'Manchester Museum,' by T. A. Coward; and 'Muscineae of the Wirral,' by W. A. Lee and W. G. Travis.

No. 16 of the *Journal of the East Africa and Uganda Natural History Society* (Longmans, Green & Co., 6/6), contains, among other notes, the following:—'On a Collection of Birds from Turkanaland,' by V. G. L. van Someren; 'Notes on East African Mammalia,' and 'Notes on East African Tortoises,' by A. Loveridge; 'Geographical Variation of some East African Butterflies,' by K. St. Aubyn Rogers; and 'Notes on Salt Caves of Lumbwa,' by A. Knight Bruce.

We are glad to observe the continued publication of *The Essex Naturalist*, pt. 5 of Vol. XIX., covering the period April to September, 1921, having been recently issued. Among the contents are:—'Ten years progress in Lichenology: A Presidential Address,' by R. Paulson; 'Samuel Harsnett, Archbishop of York,' by G. Rickword; 'Bird Notes in Wanstead Park, February, 1877,' by the late A. Lister; 'British Oysters: Past and Present,' by A. Bell; 'A MS. Essex Florula,' by G. S. Boulger.

We notice the following letter in a recent issue of *The Yorkshire Weekly Post*:—'I see in your interesting page devoted to Literary and other Societies, a report of the Yorkshire Natural Science Association, "An Organisation recently formed of teachers of Science, especially of Chemistry and Physics," and it is immediately followed by a report of a meeting of the Yorkshire Naturalists' Union, which is one of the oldest Societies of its kind in the country. In view of the similarity in these two titles, I would suggest that the recent Yorkshire Natural Science Association either changes its title or drops the word "Natural."—T.S.

The Journal of Ecology for September is admirably produced, and forms a substantial addition to the literature of this particular branch of Science. Among the numerous contents of this part we notice the following papers which will particularly appeal to our readers, 'The Ecology of *Urtica dioica*,' by C. Olsen; 'The Durmast oak-woods of the Silurian and Malvernian strata near Malvern,' by E. J. Salisbury and A. G. Tansley; 'The Effect of peat on the transpiration and growth of certain plants,' by Kathleen M. Thatcher; 'The Ecology of *Calluna vulgaris*,' by M. C. Rayner; 'Some Observations on Plants in the Libyan Desert,' by H. H. Thomas.

PLANT GALL FORAY AT LEEDS.

WM. FALCONER, F.E.S.

THE members of the Union interested in plant galls met for the second time at Leeds on Saturday, September 17th, to continue their investigation of the Roundhay Park and Adel Moor districts. In the morning the party traversed that part of the park lying between the Canal Gardens and the far end of the Gorge; in the afternoon, much the same ground was covered as on the previous occasion.* At neither meeting was the productive-looking valley below Adel Bog investigated, lack of time in one instance, and the approaching dusk in the other, preventing any search there.

At the end of the ramble, no fewer than 76 different forms had been collectively recognised as affecting 34 different species of plants; 59 of them are recorded below, all but 6 (now found in other parts of the route) being additions to the May gathering.* Included were one or two noteworthy finds. *Asterodiaspis quercicola* Bché, of which I know no other northern records than the two given in the list, may easily, from its inconspicuousness, be overlooked, but in all probability, it will be found elsewhere in Yorkshire if properly searched for in its season. It seems to prefer scrub by the roadside, and young oaks in woods, the habitats respectively in the two recorded county stations. Specimens which I have under observation at home appear to be developing, the outline is less circular and the covering membrane is becoming darker in colour and bulging outwards. *Perrisia galeobdolon-tis* Winn., which again occurred freely in the Gorge, is stated in the lists of Messrs. Bagnall and Harrison† not to occur in the north of England. I have met with it also at Thunder Bridge, Huddersfield. *P. populeti* Rübs. is new to the county, but is on record for Northumberland and Durham. In Roundhay Park, as I have seen in localities elsewhere, some leaves of the oak have their midrib slightly swollen and twisted, usually in the apical half; there is often a fracture at this point, and beyond it a pleating of the blade, and an overlapping and torsion of the lobes. So far I have not discovered the agent concerned (if there be one), and this is a question which needs clearing up.

Meetings of the Plant Gall Committee will be held next year at Askham Bog and Harewood, if suitable arrangements can be made.

* See *The Naturalist*, August 1921, pp. 269-272.

† *Trans. Ent. Soc., London*, issued 1918, pp. 348-426, and *Nat.*, October 1921, pp. 337-341.

BRACKEN.

- DIP. *Perrisia filicina* Kieff. Roundhay Park.

MOLINIA.

- DIP. *Mayetiola ventricola* Rubs. Adel Moor, in plenty.

WILLOWS.

- HYM. *Pontania proxima* Lieb. On *S. alba*, *fragilis*, *aurita*, *cinerea* and *caprea*; commonly throughout the route.
P. pedunculi Htg. On *S. aurita*. Adel Moor, near the bog.
P. viminalis Htg. On *S. cinerea*, Adel Moor.

- DIP. *Iteomyia capreae* Winn. On *S. caprea*, *cinerea* and *aurita*, Adel Moor.

I. capreae Winn, var. *major* Kieff. On *S. cinerea* and *aurita*, with the last.

Rhabdophaga nervorum Kieff. On *S. cinerea*, with the last. There was also a slight swelling of some lateral veins and a bending of the leaf, probably due to the same agent.

- AC. *Eriophyes salicis* Nal. On *S. caprea*, *cinerea* and *aurita*, Adel Moor.

ASPEN.

- DIP. *Perrisia populeti* Rubs. On the confines of Adel Bog, one example. Have noted it also in Askham Bog, and at Thunder Bridge, near Huddersfield; in the last named place in fair quantity. It is not given as a Yorkshire species in Messrs. Bagnall and Harrison's list.*

BIRCH.

- DIP. *Semudobia betulae* Winn. In female catkins, Adel Moor.
Contarinia betulina Kieff. Adel Moor.

- FUN. *Exoascus turgidus* Sdbk. Roundhay Park and Adel Moor.

ALDER.

- AC. *Eriophyes nalepai* and *E. brevitaris* Fckn.—Roundhay Park and Adel Moor.

Eriophyes spec. Houard 1135, 'abnormal rows of brown hairs along the nervures'; Adel Moor. No mites of 'erio-phyed' form were noticed, but a number of tiny ones belonging to the *Tetranychidae*, whose glistening and globular eggs, large in proportion, arranged systematically along the nerves in their axils, and often separated by exact intervals, form a wonderful and interesting sight.

- FUN. *Frankiella alni* R. Maire. Adel Moor.

OAK.

- HYM.—*Andricus solitarius* Fonsc. Near the Upper Lake, Roundhay Park and Adel Moor, one example at each place.

A. ostreus Gir. General throughout the route.

A. testaceipes Htg. In leaf petioles, the Gorge, Roundhay Park.
Cynips Kollari Htg. King Wood Lane.

Dryophanta verrucosa var. *divisa* Htg. Occurred throughout the route.

D. agama Htg. Roundhay Park and Adel Moor.

Neuroterus albipes f. *laeviusculus* Schr. Roundhay Park and King Wood Lane; not in any quantity.

N. baccaram f. *lenticularis* Oliv. Throughout the route in extraordinary abundance, especially in Roundhay Park, where the lower surface of all the leaves on the young shoots was completely covered with overlapping, and often distorted spangles. Old galls of *N. baccarum* were still in evidence.

N. vesicator Schl. One example Roundhay Park.

N. vesicator f. *numismatis* Oliv. Colonies of this beautiful gall occurred throughout the route.

* *The Naturalist*, October 1921, pp. 337-341.

- DIP. *Macrodiplosis dryobia* F. Low. Near the Upper Lake, Roundhay Park and Adel Moor.
Contarinia quercina Rubs. One tree in Roundhay Park, apparently the remains of this gall. Previously recorded from the Leeds district.
- HOM. *Asterodiaspis quercicola* Bché. By the top path of the Gorge, Roundhay Park, on the young twigs of *Q. pedunculata*; little round pits, irregularly disposed, each surrounded by a slightly raised rim of bark and closed by a thin circular orange brown membrane, at first easily detachable; sometimes accompanied by slight local discoloration of the twig. I had previously met with it in a Huddersfield locality.
- BEECH.
- DIP. *Hartigiola annulipes* Htg. Roundhay Park, King Wood Lane and Adel Moor.
- NETTLE.
- DIP. *Perrisia urticae* Perr. Throughout the route.
- HOM. *Trioza urticae* Linn. King Wood Lane.
- ORACHE.
- HOM. *Aphis atriplicis* Linn. On *A. patula*, King Wood Lane.
- RED CAMPION.
- DIP. *Contarinia steini* Karsch. By the stream side, near Adel Bog.
- CREEPING BUTTERCUP.
- FUN. *Urocystis anemones* Pers. Near the Upper Lake, and in the Gorge, Roundhay Park.
- COLTSFOOT.
- FUN. *Puccinia poarum* Nielsen. Near the Upper Lake, Roundhay Park.
- MEADOW SWEET.
- DIP. *Perrisia ulmariae* Brini. In wet places, Roundhay Park and Adel Moor.
P. engstfeldii Rubs. In the Gorge, Roundhay Park.
- BRAMBLE.
- DIP. *P. plicatrix* H. Low. King Wood Lane and Adel Moor.
- TORMENTIL.
- HYM. *Xestophanes brevitaris* Thoms. By the stream side at Adel Bog, in some quantity.
- WILD ROSE.
- Rhodites eglanteriae* Htg. King Wood Lane and Adel Moor; plentiful where observed.
- DIP. *Perrisia rosarum* Hdy. Adel Moor.
- MOUNTAIN ASH.
- DIP. *Contarinia sorbi* Kieff. Several examples on one tree by the upper path of the gorge.
- HAWTHORN.
- AC. *Eriophyes goniothorax* Nal. Beside Adel Bog.
- DIP. *Perrisia crataegi* Winn. Throughout the route.
- GORSE.
- DIP. *Asphondylia ulicis* Verrall. Adel Moor, in one spot, Mr. W. H. Burrell, and previously known to him.
- ANGELICA.
- DIP. *Kiefferia pimpinellae* F. Löw. Near the Upper Lake, Roundhay Park.
- HEATH BEDSTRAW.
- AC. *Eriophyes galii* Karp. King Wood Lane, plentiful.
- ELDER.
- AC. *Epitrimerus trilobus* Nal. The Gorge, Roundhay Park.

MARSH RAGWORT.

DIP. *Phorbia seneciella* Meade. Adel Bog, Reformatory side, conspicuous by reason of the characteristic foam-like covering of the larvae showing externally.

Cecidomyia spec. Houard, 5858, in the same place.

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YORKSHIRE NATURALISTS' UNION:

BOTANICAL SECTION, ANNUAL MEETING, October 15, 1921.

By the kind invitation of Prof. J. H. Priestley, this section met in the Botanical department of the Leeds University. The afternoon was devoted to a discussion on the effects of the abnormal weather, the gist of which is incorporated in the Annual Report. The officials and members of the various Committees for 1922 were recommended for election at the Annual Meeting of the Union at Hull.

Tea was taken next, the members being greatly indebted to Mrs. Priestley and Mrs. Pearsall for their kindness in providing this stimulus before the evening programme.

Mr. W. H. Burrell submitted some notes on the Moss flora of Hard and Soft waters. The general conclusions were that the majority of aquatic bryophytes in Yorkshire waters were indifferent to the amount of lime in solution; some showed a slight preference for either hard or soft water, and a few were strongly calciphilous (as *Weisia verticillata*, *W. rupestris*, *Hypnum commutatum*, *H. virescens*) or calciphobous (as *Racomitrium aciculare*, *Eurhynchium myosuroides* var. *rivulare*, *Hycomium flagellare*, *Hypnum ochraceum*), and these were useful indicators of the source of the water in which they flourished.

The total hardness of the waters examined varied from 1° to over 15° Clark. Streams of the gritstone moors showed 1° to 3°; Mountain limestone waters varied between 8° and 15°. The evidence suggested that 6° total hardness was the dividing line between hard and soft waters from a bryological point of view, the mosses in certain streams showing that amount of hardness being apparently controlled by the rock in the stream bed rather than by the lime content of the water.

Mr. J. W. H. Johnson dealt with a peculiarity in the Algal flora of Gordale beck and Airehead, where at certain seasons *Tetraspora gelatinosa* occurred in great quantity in certain isolated sections of the becks, the cause for which still needed explanation. He also referred to the abundance of a Bacterium—*Microspora amoeba*—in association with the Alga, and pointed out that the purity of a water should be determined by the kinds of bacteria present rather than by their numbers.

Mr. R. W. Butcher, in some notes on a study of Plankton in the Wharfe at Harewood Bridge brought forward the interesting fact that *Tetraspora gelatinosa* was present in his dredgings from the Wharfe at a period of the year immediately following the break up of the masses in the Upper Aire at Gordale. He also exhibited specimens of *Tillaea fluviatilis* recently discovered in the neighbourhood of Leeds.

Dr. W. H. Pearsall submitted a note on the relationships of certain mosses to soil acidity. Composite soil samples were taken representing surface soil of a square metre, to a depth of 2 in. These were washed with water, and the washings determined for acidity. In the quadrats dealt with, the mosses showed varying degrees of tolerance: *Mnium hornum* and *Catharinea undulata* were complimentary, the latter being plentiful on feebly acid soils, and the former replacing it on more strongly acid soils. *Hypnum cupressiforme* covered the whole range of tests, while *Hypnum molluscum* was restricted to the basic side of the neutral line, and might be accepted as an indicator of soils containing carbonate of lime.—CHRIS. A. CHEETHAM.

ADDITIONS TO YORKSHIRE DIPTERA LIST.

CHRIS. A. CHEETHAM.

SINCE the list of additions published in *The Naturalist*, 1920, pp. 227/234, about 44 other species have been recorded in notices of Union excursions and field notes; the list of Midge galls, 1921, pp. 337/341, added about 98 more; and the following list of 165 will give a total of 1064. This is scarcely one-third of the British list, and much work remains to be done before the diptera fauna of the county can be considered as well worked as the coleoptera or lepidoptera.

The type collection presented to the Union by Mr. P. H. Grimshaw has been of great assistance in the determination of species represented in it, he has also verified many others; Mr. J. E. Collin has kindly assisted in the identification of many Empids and Acalypterates; and Mr. F. W. Edwards' interest and ever ready help has put the Limnobiid and Mycetophilid groups into a far more satisfactory state. Without such kindly aids it would be a difficult task, and it is not possible to thank them sufficiently for their help; their initials are added after those of the collector, where they have verified the species. Collectors' initials will be known from names in the Union's Entomological Committees.

Where contracted Aus.=Austwick; Cg.Wd.=Crag Wood.

Sciara longiventris Ztt. Farnley, -/7/18, C.A.C., F.W.E., in Brit. Mus. Coll.

S. rufiventris Mcq. Austwick, 17/7/20, C.A.C., F.W.E.

Mycetophila vittipes Ztt. Farnley, 13/10/20, Austwick, 23/2/19, C.A.C., F.W.E.

M. marginata Winn. Austwick, 23/2/20, C.A.C., F.W.E.

Trichonta hamata Mik. Austwick, 23/10/20, C.A.C. F.W.E., in Brit. Mus. Coll.

Exechia guttiventris Mg. Pateley, 7/8/20, C.A.C., F.W.E.; Austwick and Ribbleshead, 23/10/20.

E. tenuicornis v.d. Wulp. Austwick, 17/10/20, C.A.C., F.W.E.

E. trivittata Staeg. Ribbleshead and Austwick, 23/10/20; C.A.C., F.W.E.

Allodia (Mycetophila) longicornis Wlk. Farnley, 6/5/19, Austwick, 23/10/20, Great Blake Ghyll, 14/5/21, C.A.C., F.W.E.

Mycetophila (Mycothera) dimidiata Staeg. Farnley, 13/10/20, C.A.C., F.W.E.

Allodia caudata Winn. (*Brachycampa griseicollis* Staeg.). Farnley, 22/7/20, 13/10/20, C.A.C., F.W.E.

Phronia forcipula Winn. Great Blake Ghyll, 14/5/21, C.A.C., F.W.E.

Leiomyia (Glophyroptera) fascipennis Mg. Farnley, -/7/18, C.A.C., F.W.E.

Boletina trivittata Mg. Gt. Blake Ghyll, 14/5/21, C.A.C., F.W.E.

Apoliphthisa subincana Curt. Crag Wood, 7/5/21, F.W.E.

Mycomyia (Sciophila) marginata Mg. Pateley, 8/8/20, C.A.C., F.W.E.

Platyura nigriceps Wlk. Cg.Wd., C.A.C., F.W.E., in Brit. Mus. Coll.

P. flava Winn. (Mcq.). Pateley, C.A.C., F.W.E.

P. nemoralis Mq. Austwick, 5/5/20, C.A.C., F.W.E.

Ceroplatus lineatus F. Farnley, 11/6/19, C.A.C., F.W.E.

Macrochera angulata Mg. Crag Wood, 30/6/20, C.A.C., F.W.E.

M. stigma Curt. Pateley, 8/8/21, C.A.C., F.W.E.

- Chironomus moerens* Wlk. F.W.E. says the insect recorded as *Orthocladius dolens* should be under this name. I have it from Chelker as well as Bramhope.
- Palpomyia (Ceratopogon) flavipes* Mg. Cg.Wd., 18/6/20, C.A.C., F.W.E.
- P. (C.) hortulana* Mg. Pateley, 7/8/20, C.A.C., F.W.E., in Brit. Mus. Coll.
- Dixa aestivalis* Mg. Austwick, 18/9/20, C.A.C., F.W.E.
- Ptychoptera minuta* Tonnoir. Austwick, C.A.C., F.W.E.
- Pachyrrhina crocata* L. Crag Wood, Adel, C.A.C.; Doncaster, H.H.C.; Bubwith, W.J.F.
- P. scurra* Mg. Skipwith, 3/9/21, C.A.C.
- P. annulicornis* Mg. Austwick, 13/6/20, Adel, 2/6/20, C.A.C.; Grass-woods, R.B., 3/6/20.
- P. lunulicornis* Schum. Crag Wood, 9/6/20, 30/6/20, C.A.C.
- Xiphura nigricornis* Mg. Deffer Wood, 6/5/20, B.M., P.H.G.
- Linnobia macrostigma* Schum. Austwick, 7/6/20, C.A.C., F.W.E.
- Dicranomyia modesta* Mg. Allerthorpe, 25/9/20, C.A.C., F.W.E.
- D. lutea* Mg. Pateley, 7/8/20, Cray, 24/5/20, Ling Ghyll, 26/6/20, C.A.C., F.W.E.
- D. didyma* Mg. Manningham, J.H.A.
- D. morio*, F. Austwick, 8/5/20, C.A.C., F.W.E.
- D. affinis* Schum. Crag Wood, 9/6/20, C.A.C., F.W.E.
- D. autumnalis* Staeg. Austwick, 13/6/20, C.A.C., F.W.E., ovipositing on wet moss on rocks in stream, 18/9/20.
- D. mitis* (Mg.) Goet. Cray, 25/5/20. Austwick, 7/6/20, C.A.C., F.W.E.
- Heilus dubius* Edw. (*Rhamphidia longirostris*). Gormire, 26/6/20, Austwick, 5/6/20, C.A.C., F.W.E.
- Antocha vitripennis* Mg. Austwick, 10/7/20, C.A.C., F.W.E.
- Empeda flava* Schum. Austwick, 10/7/20, C.A.C., F.W.E.
- E. nubila* Schum. Farnley, 21/8/20, Austwick, 10/7/20, C.A.C., F.W.E.
- Gonomyia lucidula* Meij. Austwick, 24/7/20, Crag Wood, 8/7/20, C.A.C., F.W.E.
- G. dentata* Meij. Austwick, 18/9/20, C.A.C., F.W.E.
- G. simplex* Tonnoir. Aus., 5/6/20, Cg.Wd., 9/6/20, C.A.C., F.W.E.
- Ilisia (Acyphona) maculata* Mg. Austwick, 5/6/20, C.A.C., F.W.E.
- I. areolata* Siebke. Farnley, 26/5/20, C.A.C., F.W.E.
- Molophilus occultus* Mg. Austwick Moss, 25/6/21, C.A.C., F.W.E. dancing in groups of 20 or so all over.
- M. appendiculatus* Staeg. Austwick, 24/7/20, C.A.C., F.W.E.
- M. propinquus* Egg. Austwick, 24/7/20, C.A.C., F.W.E.
- M. bifilatus* Verr. Austwick, 17/7/20, 18/9/20, C.A.C., F.W.E.
- M. gladius* Meij. Crag Wood, 9/6/20, C.A.C., F.W.E.
- M. armatus* Meij. Crag Wood, 9/6/20, C.A.C., F.W.E.
- M. medius* Meij. Austwick, 24/7/20, C.A.C., F.W.E.
- M. flavus* Goet. Pateley, 7/8/20, C.A.C., F.W.E.
- M. bifidus* Goet. Austwick, 24/7/20, C.A.C., F.W.E.
- Ormosia (Rhypholophus) aciculata* Edw. Stonesdale, 23/5/20, C.A.C., F.W.E. This is the *R. nodulosus* recorded previously.
- O. (Rhypholophus) uncinata* Meij. Dibscar Coniston, 25/5/20, C.A.C., F.W.E.
- O. (Rhypholophus) pseudosimilis* Lundst. Cg.Wd., 9/6/20, C.A.C., F.W.E.
- Erioptera taenionota* Mg. Adel, 12/5/20, Austwick, 24/7/20, 18/9/20, C.A.C., F.W.E.
- E. fuscipennis* Mg. Beverley, 2/8/20, Gormire, 26/6/20, Farnley, 21/8/20, Austwick, 5/6/20, 15/8/20, C.A.C., F.W.E.
- Erioptera trivialis* Mg. Beverley, 2/8/20, Gormire, 4/8/20, Farnley, 7/6/20, Austwick, 13/6/20, Adel, 12/5/20, C.A.C., F.W.E.
- E. nielsenii* Meij. Austwick, 27/8/20, C.A.C., F.W.E.
- E. diuturna* Wlk. Austwick, 18/9/20, 9/10/20, C.A.C., F.W.E.
- E. squalida* Lw. Gormire, 26/6/20, Stonesdale, 22/5/20, C.A.C., F.W.E.

- Idioptera fasciata* L. Austwick, 5/6/20, C.A.C., F.W.E.
Dactylolabis frauenfeldi Egg. Dibscar, Coniston, 25/5/20, C.A.C., F.W.E.
D. gracilipes Lw. Austwick, C.A.C., F.W.E.
Limnophila ferruginea Mg. Beverley, 3/8/20, Austwick, 8/5/20, 27/8/20, Crag Wood, 9/6/20, Adel, 6/10/20, C.A.C., F.W.E.
L. ochracea Mg. Pateley, 7/8/20, Crag Wood, 8/7/20, C.A.C., F.W.E.
L. bicolor Mg. Crag Wood, 8/6/20, C.A.C., F.W.E.
L. discicollis Mg. Beverley, 3/8/20, Farnley, 21/8/20, Austwick, 5/6/20, Crag Wood, 9/6/20, C.A.C., F.W.E.
L. filata Wlk. Farnley, 7/6/20, Pateley, C.A.C., F.W.E.
L. nigrina Mg. Austwick, 13/5/20 (var.), 7/6/20, C.A.C., F.W.E.
L. abdominalis Staeg. Crag Wood, 9/6/20, C.A.C., F.W.E.
L. leucophaea (Mg.) Meij. Crag Wood, 8/7/20, C.A.C., F.W.E.
Adelphomyia senelis Hal. Crag Wood, 19/7/20, C.A.C., F.W.E.
Trichocera fuscata Mg. Austwick, 9/10/20, C.A.C. F.W.E. puts these females under this name with a (?)
Dicranota pavida Hal. Austwick, 18/9/20, C.A.C., F.W.E.
D. guerini Zett. Austwick, 17/4/20, 23/10/20, Malham, 14/9/20, C.A.C. F.W.E.
D. subtilis Lw. Austwick, 23/10/20, Kisdon, 23/5/20, C.A.C., F.W.E.
Trichyphona (Amalopsis) unicolor Schum. Cg.Wd., 9/6/20, C.A.C., ,
Oxycera pardalina Mg. Austwick, 16/7/21, C.A.C.
Theriopterus montanus Mg. Austwick, 17/7/21, Pilmoor, 27/6/20, C.A.C., J.E.C.
Dioctria atricapilla Mg. Wheatley Wood, H.H.C.
D. Baumhaueri Mg. Allerthorpe, W.J.F.
Isopogon brevivestris Mg. Grassington, 21/8/20, R.B.
Rhamphomyia hybotina Ztt. Pateley, 7/8/20, C.A.C., P.H.G.
R. variabilis Flin. Allerthorpe, 25/9/20, Aus., 15/8/20, C.A.C., P.H.G.
Empis pennipes L. Crag Wood, 1/6/21, C.A.C., J.E.C.
Clinocera (Heleodromia) wesmaelii Mcq. Dent, 26/2/21, C.A.C., J.E.C.
Ardoptera guttata Hal. Crag Wood, 7/5/21, C.A.C.
Chelipoda (Lepidomyia) melanocephala Fabr. Austwick, 3/7/21, C.A.C.
Tachista annulimana Mg. Kilnsey Crag, 24/7/20, C.A.C., P.H.G.
Tachydromia ciliaris Flin. Pateley, 8/8/20, C.A.C., J.E.C.
Eutarsus aulicus Mg. Bubwith, W.J.F., J.E.C.
Porphyrops nasuta Flin. Bubwith, W.J.F., J.E.C.
Systemus adpropinquans Lw. Crag Wood, 1/6/21, C.A.C.
Syntormon tarsatus Flin. Adel, 5/7/21, Austwick, 2/7/21, C.A.C.
Hydrophorus borealis Lw. Helwith Moss, 1/10/21, C.A.C.
Chalarus spurius Flin. Nidd, 1/8/21, C.A.C.
Pipunculus xanthopus Thoms. Austwick, 18/6/21, C.A.C., J.E.C.
Pipizella flavitarsis Mg. Austwick, 18/6/21, C.A.C. The *P. Heringi* Ztt., recorded from Martin Beck and Saltaire belong here.
P. virens F. Allerthorpe, W.J.F.
Pipiza noctiluca L. Crag Wood, 9/6/20, C.A.C., Keighley, R.B.
P. lugubris F. Pilmoor, 7/8/19, C.A.C., P.G.H.
Orthoneura brevicornis Lw. Crag Wood, 25/5/21, C.A.C.
Chilosia longula Ztt. Nidd, 7/9/19, Martin Beck, 19/6/20, C.A.C., P.H.G.
C. impressa Lw. Adel, 30/8/19, C.A.C.
C. Bergenstammi Beck. Pateley, 9/8/20, Farnley, 21/8/20, C.A.C., P.H.G.
C. proxima Ztt. Adel, 13/9/19, Austwick, 1/6/19, Farnley, 21/8/20, C.A.C., P.H.G.
Didea intermedia Lw. Pateley, 6/8/20, Austwick, 25/9/21, C.A.C.
Syrphus annulipes Ztt. Pateley, 6/8/20, C.A.C.
S. latifasciatus Mcq. Keighley, -/6/19, R.B.
Xylota lenta Mg. Crag Wood, 6/6/21, C.A.C.
Eumerus strigatus Flin. Farnley, 18/8/21, C.A.C.

- Conops flavipes* L. Nidd, 1/8/21, C.A.C.
Ceromasia machairopsis B. and B. (*agilis* Mg.). Adel, 13/0/19, C.A.C.
Exorista agnata Rnd. Huddersfield, G.T.P., bred from *A. grossulariata*.
Varichaeta (Erigone) strenua Mg. Farnley, -/7/18, C.A.C.
Roeselia antiqua Mg. Farnley, 21/8/20, C.A.C.
Melanophora roralis L. Austwick, -/9/18, 25/6/21, C.A.C.
Onesia cognata Mg. Austwick, 24/5/19, C.A.C., P.H.G.
Metopia leucocephala Rossi. Roundhay, A.E.B. Seen entering burrows of *Halictus atricornis*, *H. freygusneri* and *Salix parvulus*.
Dexia vacua Flin. Austwick, 17/7/21, 13/8/21, C.A.C.
Myiocera carinifrons Fen. Pateley, 1/8/20, C.A.C., F.W.E.
Pollenia vespillo F. Cray, 24/5/20, C.A.C., P.H.G.; Pateley, 7/8/20, Austwick, 16/7/21, C.A.C.
Hyetodesia marmorata Ztt. Austwick, 21/6/19, C.A.C.
H. signata Mg. Austwick, 17/9/21, C.A.C.
Pegomyia ephippium Ztt. (*geniculata* Bonché). Austwick, 28/8/19, C.A.C., P.H.G.
Lispa uliginosa Flin. Bubwith, 25/6/19, C.A.C.
Paralleloma vittata Mg. Chapel-le-dale, 16/5/21, C.A.C. J.E.C. says 'a little doubtful because of its dark third antennal joint, just possible there may be two closely related species.'
Trichopalpus fraternus Mg. Farnley, -/8/18, C.A.C., J.E.C.
T. punctipes Mg. Austwick, 12/7/19, C.A.C.
Clidogastra nigrita Flin. Austwick, 5/6/20, C.A.C., J.E.C., Crag Wood, 9/6/20, C.A.C.
Helomyza variegata Lw. Crag Wood, 6/6/21, C.A.C., J.E.C.; Austwick, 25/6/21, C.A.C.
H. flava Mg. Austwick, 28/6/19, C.A.C., J.E.C.
H. Zetterstedtii Lw. Austwick, 1/6/19 C.A.C. J.E.C.
Leria flavo-testacea Ztt. Crag Wood, 25/5/21, Farnley, 7/6/21, Pateley, 5/7/19, C.A.C., J.E.C.
Heteroneura albirimana Mg. Farnley, 29/6/21, Crag Wood, 28/6/21, C.A.C., J.E.C.
Lucina fasciata Mg. Spurn, 3/8/19, C.A.C.
Oedoparea buccata Flin. Spurn, 3/8/19, C.A.C., J.E.C.
Dryomyza senilis Ztt. A series from Austwick decided J.E.C. that this species is the female of *decrepita* Ztt.
Neottiophilum praeustum Mg. Farnley, 23/6/20, C.A.C., J.E.C.
Sciomyza simplex Schn. Bubwith, 25/6/19, C.A.C., J.E.C.
Phaeomyia fuscipennis Mg. Nidd, 1/8/21, C.A.C., J.E.C.
Psila rufa Mg. Nidd, Adel, Linghyll, Austwick, C.A.C.
Psila nigromaculata Strobl. Austwick, 28/6/19, C.A.C., J.E.C.
P. humeralis Ztt. Austwick, 22/8/19, C.A.C., J.E.C.
P. atra Mg. Crag Wood, 9/6/20, C.A.C., J.E.C.
Loxocera sylvatica Mg. Barden, 21/6/19, R.B., J.E.C.
Platystoma seminationis F. Fountains Abbey, F.R., P.H.G.
Tephritis conura Lw. Keighley, 21/6/19, R.B.
Urellia stellata Fuessl. Skipwith, 3/9/21, C.A.C.
Euaresia conjuncta Lw. Allerthorpe, 25/9/20, C.A.C.
Toxoneura muliebris Harr. Farnley, 29/10/21, N. A. Burniston.
Sapromyza inusta Mg. Gormire, 3/8/20, Cg. Wd., 30/6/20, C.A.C., J.E.C.
S. praecusta Flin. Austwick, 10/7/20, C.A.C., J.E.C.
S. sordida Hal. Farnley, 13/8/20, C.A.C., J.E.C.
Pelethophila (Chiromyia) flava L. Farnley, -/7/18, C.A.C., J.E.C.
Sepsis violacea Mg. Aus., 18/4/20, Crag Wood, 7/5/21, C.A.C., P.H.G.
Themira minor Hal. Whernside, 16/5/21, C.A.C., J.E.C.
Piophilula vulgaris Flin. (*atrata*), Farnley, 3/9/20, C.A.C., J.E.C.
Scaptomyza tetrasticha Beck. Crag Wood, 7/5/21, C.A.C., J.E.C.
Parhydra coarctata Flin. Allerthorpe, 25/9/20, C.A.C.
Phytomyza (Napomyza) elegans Mg. Adel, 5/7/21, C.A.C., J.E.C.
Trineura velutina Mg. Barden, 24/7/20, Pateley, 3/8/20, C.A.C., J.E.C.

PRELIMINARY LIST OF YORKSHIRE HEMIPTERA —HETEROPTERA.

W. J. FORDHAM, M.R.C.S., D.P.H., F.E.S.

(Continued from page 336).

- Acompocoris pygmaeus* Fall. Bubwith, W. J. F.; Ecclesall Wood, J. M. B.
Triphleps majuscula Rent. Bubwith on *Verbascum*, and Brighton, on elder, W. J. F.; Sheffield, J. M. B.
Microphysa pselaphiformis Curt. Halifax, J. Curtis, *Ent. Mag.*, Jan., 1833, p. 198 (3).
M. elegantula Boer. Mulgrave Park, on bark, E. A. B.

Family CAPSIDAE.

- Pithanus maerkeli* H. S. Bubwith, Ellerton and Allerthorpe Common, W. J. F.; Wharnccliffe and Ecclesall Woods, J. M. B.; Austwick, W. J. F.; Crathorne, near Yarm, W. J. F.
Miriscalcaratus Fall. Allerthorpe Common and Skipwith, W. J. F.; Sandal Beat, Wadsworth, Tweenwoods, Brockodale, Thorne and Wheatley Wood, H. V. C.; Scarborough, T. W. (3); Ruswarp, W. J. F.
M. laevigatus L. Scarborough, T. W. (3); Sandall Beat, Thorne Moor and Blaxton, H. V. C.; Wharnccliffe, J. M. B.
M. holsatus F. Allerthorpe Common, W. J. F.; Sandal Beat, Owston, Thorne Moor and Blaxton, H. V. C.; Keighley and Grassington, R. B.; Ecclesall Wood, J. M. B.; Staintondale and Ramsdale, W. J. F.; Austwick, W. J. F.; near High Force, J. E. M. (8).
Megaloceraea erratica L. Skipwith and Allerthorpe Common, W. J. F.; Thorne, Blaxton and Bentley Ings, H. V. C.; Austwick, W. J. F.
M. ruficornis Fourc. Skipwith Common, W. J. F.; Scarborough, T. W. (3); Wharnccliffe, J. M. B.; Kilham and Wheatley Woods, H. V. C.; Keighley, abundant, R. B.
Teratocoris saundersi D. and S. Eshton, R. B.
Leptopterna ferrugata Fall. East Cottingwith and Allerthorpe Common, W. J. F.; Whitby, H. D. Smart; Shelley, H. D. Smart; Elam Wood, Keighley, R. B.
L. dolabrata L. Bubwith and district, W. J. F.; Stamford Bridge and Nunthorpe, W. J. F.; Wheatley Wood, H. V. C.
Monalocoris filicis L. Skipwith, Bubwith and Escrick, W. J. F.; Tweenwoods, Wadsworth, Wheatley Wood and Rossington Bridge, H. V. C.; Wharnccliffe and Ecclesall Wood, J. M. B.; Shipley Glen, J. W. C.; Keighley, R. B.
Bryocoris pteridis Fall. Lytle, on *Pteris*, E. A. B.
Pantilius tunicatus F. Bubwith, W. J. F.; Rossington Bridge and Loversal Carr, H. V. C.
Lopus gothicus L. East Cottingwith and Melbourne, W. J. F.; Whitby, H. D. S.; Martin Beck, H. H. C. (6).
Phytocoris populi L. Edlington Wood, H. V. C.; Martin Beck, H. H. C. (6).
 var. *distinctus* D. and S. Cowling, R. B.
P. tiliae F. Escrick, W. J. F.; Wheatley Wood, H. V. C.
P. longipennis Flor. (*dimidiatus* D. and S.). Seamer Moor, W. J. F.; Edlington Wood, H. V. C.; Wheatley Wood, H. H. C. (6); Rawdon, A. R. Sanderson; Eshton and Bradley, near Skipton, R. B.

- Phytocoris dimidiatus* Kb. (*dubius* D. and S.). Melbourne, W. J. F.; Ecclesall Wood and Wharncliffe, J. M. B.
- P. pini* Kb. Skipwith Common, W. J. F.; Wheatley Wood, H. H. C. (6)
- P. varipes* Boh. (*ulmi* D. and S.). Doncaster, H. V. C.
- P. ulmi* L. (*divergens* D. and S.). East Cottingwith and Allerthorpe Common, W. J. F.; Tweenwoods, Wadsworth, Wheatley Wood and Blaxton; H. V. C.; Eshton, R. B.
- Calocoris ochromelas* Gmel. (*striatellus* F.). Near Hull, J. Young (4); Bubwith, Escrick and Melbourne, W. J. F.
- C. sexguttatus* F. Bubwith, W. J. F.; Nunthorpe, W. J. F.; Ecclesall Wood, J. M. B.; York, Billups (1); Saltaire, J. W. C.; Marley, common on nettles, Bingley, Bradley and Eshton, R. B.
- C. fulvomaculatus* D.G. Martin Beck Wood, W. J. F.
- C. alpestris* Mey. Bubwith, W. J. F.; Ecclesall Wood, J. M. B.; Gargrave, J. W. C.; Keighley, R. B.
- C. bipunctatus* F. Bubwith and district, W. J. F.; Sandtoft, Kilham and Bentley Ings, H. V. C.; Wharncliffe, J. M. B.; Askham Bog, W. J. F.; Keighley and Eshton, R. B.
- C. seticornis* F. Filey, W. W. Fowler (1), (9).
- C. striatus* L. Bubwith, W. J. F.; Ecclesall Wood and Wharncliffe, J. M. B.
- Stenotus binotatus* F. East Cottingwith on *Hypericum perforatum* W. J. F.
- Dichrooscytus rufipennis* Fall. Skipwith Common, W. J. F.; Scarborough, R. L. (1); Gill Beck, Barden, common on pines, R. B.
- Plesiocoris rugicollis* Fall. Bubwith, on willow, W. J. F.; Ecclesall Wood, J. M. B.; Eshton, R. B.
- Lygus pabulinus* L. Bubwith and Escrick, W. J. F.; Ecclesall Wood, J. M. B.; Shirley Pool, H. V. C.; Blackhills, Wilsden, J. W. C.; Grassington, R. B.; near High Force, J. E. M. (8).
- L. contaminatus* Fall (*sulcifrons* D. and S.). Allerthorpe Common, W. J. F.; Wharncliffe, J. M. B.; Askham Bog, W. J. F.; Grassington and Eshton, R. B.
- L. viridis* Fall. (*contaminatus* D. and S.). Bubwith, on elder, W. J. F.; Cowling and Grassington, R. B.; near High Force, J. E. M. (8).
- L. lucorum* Mey. Clapham, W. J. F.
- L. pratensis* L. Bubwith and district, W. J. F.; Tweenwoods, Wadsworth and Wheatley Wood, H. V. C.; Coxwold, Kildale, Ramsdale, and Staintondale, W. J. F.; Wharncliffe, S. M. B.; Edlington, W. J. F.; Askham Bog, W. J. F.
- L. rubricatus* Fall. Mulgrave Park, on Scots Fir, E. A. B.
- L. cervinus* H. S. Scarborough, T. W. (3); Eshton, R. B.
- L. pastinacae* Fall. Scarborough, T. W. (3).
- L. kalmii* L. Lythe, on nettles, E. A. B.
- Camptozygum pinastri* Fall. Skipwith Common, W. J. F.
- Poeciloscytus unifasciatus* F. Ecclesall Wood, J. M. B.; Keighley, R. B.
- P. gyllenhalii* Fall. Ellerby Moor, E. A. B.
- Liocoris tripustulatus* F. Bubwith, Escrick and East Cottingwith, W. J. F.; Cusworth, Cantley and Rossington, H. V. C.
- Rhopalotomus ater* L. Near Hull, J. Young (4); Bubwith and district, W. J. F.; Allerthorpe Common, W. J. F.; Ecclesall Wood and Wharncliffe, J. M. B.; Martin Beck, W. J. F.; Saltaire, J. W. C.; Askham Bog, W. J. F.
- Allodapus rufescens* Burm. Thorne Moor, Yorks., on *Erica*, Dale, (1), (2), (3).
- Strongylocoris leucocephalus* L. Scarborough, abundant on cliffs in short grass, and on *Vicia cracca* in July, T. W. (1), (2), (3); Newsholme Dean, Keighley, R. B.

- Macrolophus nubilus* H. S. Ecclesall Wood, J. M. B.
Dicyphus constrictus H. S. Lythe on *Lychnis diurna*, E. A. B.
D. epilobii Reut. Shirley Pool, Askern, Norton and Bentley Ings, H. V. C.; Keighley, R. B.
D. errans Wolff. Scarborough, T. W. (3).
D. stachydis Reut. Loversal Carr, H. V. C.; Ecclesall Wood and Wharncliffe, J. M. B.; Keighley, R. B.
D. pallidicornis Fieb. Aislaby, on Foxglove, chiefly brachypterous, E. A. B.
D. globulifer Fall. Scarborough, June, T. W. (3).
D. annulatus Wolff. Runswick, on *Ononis*, E. A. B.
Cyllocoris histrionicus L. Melbourne and Allerthorpe Common, on oak, W. J. F.; Ecclesall Woods, J. M. B.; Martin Beck, H. H. C. (6).
C. flavonotatus Boh. Skipwith Common, Melbourne and Seaton Ross, W. J. F.; Bolton Woods, H. H. Wallis.
Aetorhinus angulatus F. Bubwith and Skipwith Common, W. J. F.; Loversal Carr, H. V. C.; Wharncliffe, J. M. B.; Grassington, R. B.; near High Force, J. E. M. (8).
Globiceps cruciatus Rent. Harden Moor, common on ling, R. B.
G. flavomaculatus F. Allerthorpe Common, W. J. F.
Mecomma ambulans Fall. Ramsdale, Robin Hood's Bay, W. J. F.; Wheatley Wood, H. V. C.; Martin Beck, H. H. C. (6); Ecclesall Wood and Wharncliffe, J. M. B.; Keighley, R. B.
Cyrtorrhinus caricis Fall. Rossington Bridge, H. V. C.; Sunnysdale, Keighley, R. B.
Orthotylus marginalis Reut. Bubwith and district, on potato, sow and elder, W. J. F.; Keighley, R. B.
O. nassatus F. Near High Force, J. E. M. (8).
O. viridinervis Kb. Cowling, R. B.
O. prasinus Fall. Two, 'in all probability in Yorkshire,' in writer's possession, A. Buchan-Hepburn, *E.M.M.*, December, 1877, p. 164.
O. ochrotrichus D. and S. Shirley Pool, Askern, H. V. C.
O. diaphanus Kb. Shirley Pool, Askern, H. V. C.
O. ericetorum Fall. Ramsdale, W. J. F.; Wilsden on Ling, R. B.
Heterotoma merioptera Scop. Escrick, Ellerton and East Cottingwith, on nettles and *Hypericum* W. J. F.; Funningley, Rossington Golf Links and Blaxton, H. V. C.
Malacocoris chlorizans Fall. Grassington, R. B.
Conostethus roseus Fall. Scarborough, T. W. (1), (3).
Megalocoleus pilosus Schr. (*tanaceti* Fall). Melbourne, W. J. F.; Crathorne, near Yarm, W. S. F.
Macrotylus paykulli Mey. Scarborough, September, T. W. (3).
Harpocera thoracica Fall. Shipley Glen (both sexes, on rock under oak), and Keighley, R. B.
Byrsoptera rufifrons Fall. Wheatley Wood, H. V. C.
Phylus palliceps Fieb. Melbourne, on oak, W. J. F.
P. melanocephalus L. Melbourne and Allerthorpe Common, on oak, W. J. F.; Ecclesall Wood, J. M. B.; Martin Beck Wood, W. J. F.
Psallus ambiguus Fall. Bubwith and Melbourne, W. J. F.; Wheatley Wood, H. H. C. (6); Doncaster, H. V. C.; Askham Bog, W. J. F. Keighley and Grassington, R. B.
P. betuleti Fall. Escrick and Melbourne, W. J. F.; Ecclesall Wood and Wharncliffe, J. M. B.; Martin Beck, H. H. C. (6); Scarborough, T. W. (3); Keighley, J. W. C.; near High Force, J. E. M. (8).
P. variabilis Fall. Melbourne, W. J. F.; Ecclesall Wood and Wharncliffe, J. M. B.; Blackhills, Wilsden, J. W. C.; Shipley Wood, H. H. Wallis; Newsholme Dean, Keighley, and common on pines, Barden, R. B.
 var. *simillimus* D. and S. Ecclesall Wood, J. M. B.

- Psallus lepidus* Fieb. Keighley, R. B.
 var. *minor* (*roseus* D. and S.). Escrick, W. J. F.
P. fallenii Reut. Skipwith W. J. F.; Wheatley Wood, H. H. C. (6);
 Ecclesall Wood, J. M. B., Keighley, R. B.
P. varians H. S. Bubwith, Melbourne and Seaton Ross, W. J. F.;
 Wharnccliffe, J. M. B.; Nunthorpe, W. J. F.; Gill Beck, Barden,
 R. B.
P. roseus F. (*sanguineus* F.). Grassington, R. B.
P. salicellus Mey. Lastingham, birchwood, T. A. Marshall (1).
Plagiognathus albipennis Fall. Lastingham, T. A. Marshall (1).
P. chrysanthemi Wolff. Near High Force, J. E. M. (8).
P. arbustorum F. Bubwith and district, common, W. J. F.; Tween-
 woods, Wadsworth and Shirley Pool, H. V. C.; Keighley, R. B.;
 Nunthorpe, Crathorne, Sandend and Grangetown, W. J. F.;
 Edlington, W. J. F. (A black form occurred at Nunthorpe,
 Cleveland, W. J. F.)
P. wilkinsoni D. and S. Scarborough, T. W. (1), (2), (3) (see *E.M.M.*,
 1866, p. 273).
Asciodema obsoletum D. and S. Newsholme Dean, Keighley, R. B.

Family NEPIDAE.

- Nepa cinerea* L. Bubwith, W. J. F.; Sandal Lock and Brickfields,
 H. V. C.; Askern, E. Lancaster; Sheffield, J. M. B.
Ranatra linearis L. Near Leeds, Jas. Abbot, June, 1875 (W. D. R.)

Family NAUCORIDAE.

- Naucoris cimicoides* L. Sheffield, J. M. B.

FAMILY NOTONECTIDAE.

- Notonecta glauca* L. Bubwith, W. J. F.; Allerthorpe Common, W. J. F.;
 Kilham, Thorne, Broad Turn and Sandal Lock, H. V. C.; near
 Hull, F. W. Fierke, Sheffield, J. M. B.; Knottingley, W. J. F.;
 Keighley, R. B.; Osmundthorpe, W. H. Taylor; Pannal and
 Wetherby, W. D. R.; Bishopdale, W. J. F.
N. furcata F. Bubwith, W. J. F. Leeds, 1816 ('Loidis and Elmete');
 Seamer Moor, W. J. F.; Austwick Moss, W. J. F.
Plea minutissima F. Market Weighton, G. B. Walsh.

Family CORIXIDAE.

- Corixa goeffroyi* Leach. Allerthorpe, W. J. F.; Bradford, J. W. C.;
 Kilham, H. V. C.; Sheffield, J. M. B.; Knottingley, W. J. F.;
 Bingley, R. B.
C. sahlbergi Fieb. Escrick, W. J. F.; Kilham and Thorne, H. V. C.;
 Sheffield, J. M. B.; Bingley, R. B.; Austwick Moss and Bishop-
 dale, W. J. F.
C. linnaei Fieb. Escrick, W. J. F.; Thorne, H. V. C.; Bishopdale,
 W. J. F.
C. semistriata Fieb. Escrick, W. J. F.
C. venusta D. and S. Thorne, H. V. C.
C. striata L. Escrick, W. J. F.; Kilham and Thorne, H. V. C.;
 Keighley, R. B.
C. fallenii Fieb. Bubwith, W. J. F.
C. moesta Fieb. Escrick and Filey, W. J. F.; Thorne, H. V. C.
C. fossarum Leach. Thorne, H. V. C.; Eshton, R. B.
C. scottii Scott. Thorne, H. V. C.
C. nigrolineata Fieb. Seamer Moor, W. J. F. Shirley Pool, Askern,
 H. V. C.; Sheffield, J. M. B.; Bingley, R. B.
C. praeusta Fieb. Kilham, Sandal Brickfields and Thorne, H. V. C.;
 Bingley, R. B.

- Corixa praeusta* Fieb. var. *wollastoni* D. and S. Hebden Bridge, T. V. Wollaston (2), (3); Thorne, H. V. C.; Bishopdale, W. J. F.
C. concinna Fieb. Sheffield, J. M. B.
Micronecta minutissima L. Scarborough, R. L. (1); Scalby Beck, T. W. (*E.M.M.*, 1868, p. 142).

Since the above was written the following new records have come to hand, bringing the county total up to 200:—

- Gerris argentatus* Schum. Whitby, W. E. Sharp.
Teratocoris antennatus Boh. Wentworth, J. M. B.
Psallus diminutus Kb. Mulgrave Park, E. A. B.
Atractotomus magnicornis Fall. On larch, Ecclesall Wood. J. M. B.

REFERENCES.

- (1)=Saunders, E., Hemiptera Heteroptera of the British Isles, 1892.
 (2)= " " Synopsis of British Hemiptera Heteroptera, 1876.
 (*Trans. Ent. Soc. Lond.*, 1875 and 1876.)
 (3)=Douglas and Scott, British Hemiptera-Heteroptera (*Ray Soc.*), 1865.
 (4)=Jas. Young, *Ent. Weekly Intelligencer*, 21st April, 1860, p. 23.
 (5)=P. Inchbald, *The Naturalist*, I., January, 1865, p. 270.
 (6)=H. H. Corbett, *The Naturalist*, 1918, p. 262.
 (7)=J. W. H. Harrison, *Vasculum*, 1915, pp. 57 and 126.
 (8)=J. E. Mason, *The Naturalist*, September, 1889, p. 283.
 (9)=W. W. Fowler, *The Naturalist*, March, 1886, p. 66.
 E. G. B.=E. G. Bayford. J. M. B.=J. M. Brown. E. A. B.=E. A. Butler. R. B.=Rosse Butterfield. J. W. C.=J. W. Carter. H. V. C.=H. V. Corbett. W. J. F.=W. J. Fordham. R. L.=R. Lawson. W. D. R.=W. Denison Roebuck. T. S.=T. Stainforth. T. W.=T. Wilkinson.

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Marvels of the Animal World, by W. S. Berridge. London: Thornton Butterworth, 253 pp., 7/6 net. In this volume the author—a well-known popular writer on natural history subjects—has gathered together a series of articles of general interest, dealing with such a variety of topics as 'Animals as prize-fighters, Animals which sham death, Eggs, Curious messmates, Animal Sanctuaries, Animals which give electric shocks, Poisonous Animals, Goldfish, and Kangaroos.' His writings are reliable and well illustrated, there being '46 photographs from life.'

Adventures in Beaver Stream Camp, by Capt. A. R. Dugmore. London: Hodder and Stoughton, 341 pp., 8/6 net. Capt. Dugmore is obviously quite familiar with the wild life of Canada, and he knows the kind of stories likely to appeal to healthy boys. With this dual knowledge he has produced a book scientifically accurate and fascinating from the point of view of the young reader, for whom the volume is written. We observe that 'All rights reserved, including that of translation to foreign languages, including the Scandinavian.' We always thought that the Scandinavian was 'foreign'?

We have a pamphlet before us entitled 'The Faithist Scientists Church of Kosmon: Universal Religion, Being Light-suggestions, Revelations and Proclamations from Unseen Worlds, through the Lords in Light, and the Souls of Men, to men and women of the Earth and its Heavens, to guide them on their never-ending destiny, enabling them thereby to take the Path of Eternal Progression, setting aside the Dogmas, Creeds, and misleading books and teachings of the Ancients which retard man's progress towards Righteousness, Truth, Knowledge, and Happiness. Compiled by F. T. A. Davies, 40 Balham Grove, London, S.W. 12. Price 3d. each, post free (cost price).' We have not read it!

CORRESPONDENCE.

TERRITORY IN BIRD LIFE.

This question has recently received much prominence among ornithologists, and various theories have been put forward with a view to drawing up a code of rules by which a bird is supposed to be governed when fighting for its own little patch of nesting ground. No doubt every rule has its exceptions, and exceptions may prove the rule, but my experience this year, which I admit is due to exceptional circumstances, seems to show that, in at any rate two species, the hunger for territory may give place to *force majeure* under stress of necessity. My house is surrounded by grass fields which were bounded by tall hedges of the old type, and sheltered many Blackbirds and Thrushes. Early in April this year the hedges were chopped down, and bare stumps only were left. In consequence, the dispossessed Blackbirds and Thrushes crowded into the garden, about 100 yards long and 40 to 50 wide. I counted at one time nests of 7 Thrushes and 6 Blackbirds with eggs and young, and two Thrushes had nests, one with eggs and one with young, exactly 12 feet apart. The only sign of territorial acquisition was an occasional brace of Blackbirds ♂ fighting on the lawn, but the same might have been seen in any previous year. How were the boundaries of each bird's territory, if such there were, adjusted without internecine combats? Apparently all resigned themselves to the inevitable and settled down to breed in this small crowded area, very much to the detriment of the fruit crops. The inference seems to be that given sufficient feeding ground the instinct of territorial acquisitiveness may be modified or lost. In the present instance the original feeding grounds were intact and accessible by a slightly longer flight than in previous years.—E. W. WADE.

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OLD PAVING STONES FROM ICELAND? A QUESTION FOR HULL GEOLOGISTS.

William Harrison's racy 'Description of England,' first published as part of 'Holinshed's Chronicles' in 1577, of which I have a modernized reprint entitled 'Elizabethan England,' published some thirty years ago in Scott's 'Camelot Series,' contains some interesting old information for the geologist, particularly in the chapters 'Of Sundry Minerals and Metals' (Chap. XII. of my reprint) and 'Of Quarries of Stone for Building' (Chap. XVIII. of reprint). In the last-mentioned chapter, after reviewing our home-resources, the patriotic Harrison launches into a characteristic tirade (such as is still habitual to us) against the fashion of using foreign stones instead of English:—'So that I think no nation can have more excellent and greater diversity of stuff for building than we may have in England, if ourselves could so like of it. But such, alas! is our nature, that not our own, but other men's, do most of all delight us';—and then he cites several examples of this bad fashion, and goes on:—'Howbeit for all this we must fetch them still from far, *as did the Hull men their stones out of Iceland, wherewith they paved their town for want of the like in England*; or, as Sir Thomas Gresham did when he bought the stones in Flanders wherewith he paved the Burse. But as he will answer (peradventure) that he bargained for the whole mould and substance of his workmanship in Flanders, so the Hullanders or Hull men will say how that stock-fish is light loading, and therefore they did balance their vessels with these Iceland stones to keep them from turning over in their so tedious a voyage.'

Is there any trace remaining of these 'stones out of Iceland' in the paving of the older streets in Hull? Presumably the paving would be in the form of 'cobble,' and the Icelandic rocks would be basalts of sorts. But 'cobble' of basaltic rock, washed out of Glacial drifts, are abundant on the Yorkshire coast, and are numerous in all old cobbled pavements in the East Riding, most of the stones for this kind of paving

having been obtained from the shore. Indeed, one may venture to suspect that the story of Hull pavements of 'stones out of Iceland' may have been founded only on the guess of some observant old mariner who recognised the black 'cobblestones' as being like the country-rock of Iceland, and unlike any quarry-stone or flints of the neighbouring home-country. If, however, any of the old pavements are still in existence, and are found to consist entirely, or almost entirely, of basaltic rock, it would afford strong confirmation of Harrison's statement. The Holderness shore-cobbles are always a heterogeneous mixture.

At the end of the same chapter, Harrison has a quaint reference to fossils (ammonites?) which is worth quoting. He says:—'Finally, I myself have seen stones opened, and within them the substances of corrupted worms like unto adders (but far shorter), whose crests and wrinkles of body appeared also therein as if they had been engraved in the stones by art and industry of man.'—G. W. LAMPLUGH.

Sheahan, in his 'History of Hull,' 1866 edition, page 55, has the following:—'Leyland says, that "at such tyme as al the trade of stockfisch for England cam from Isleland (Iceland) to Kingston, bycause the burden of stockfisch was light, the shipes were balissed with great coble stone brought out of Isleland, the which yn continuance paved al the toun of Kingston throughout.' Camden gives pretty nearly the same account. Tickell thinks it more probable that they were brought from the Spurn Head or places adjacent, where plenty of them were to be had; but Mr. Frost tells us, that in the year 1400, paving stones constituted a part of the cargoes of two Dutch vessels, which arrived in that year, the *Mariknight*, of Amsterdam, having brought to the port 40,000; and the *Skenkewyn*, of Dordrecht, 16,000. In both of these instances (he continues) the paving stones appear to have been imported on account of the masters of the vessels, and it is therefore not improbable that they were brought for the two-fold object of ballast while on board, and of sale for paving the streets when landed.'

There can be no doubt the ballast from Iceland was brought into Hull and used for paving the streets. The late George H. Hill, a former President of the Hull Field Naturalists' Society, frequently told me how, when a boy (which would be about 1840), he used to watch this ballast being unloaded, and occasionally secured from it zeolites and other mineralogical specimens.

Nowadays the streets of Hull are paved with wood or asphalt, and the City flatters itself that it is one of the best paved cities in the country. Consequently we are not likely to-day to satisfy Mr. Lamplugh's curiosity on the question of paving cobblestones, even in the old parts of the town. There are, however, a few yards and dock-wharves still paved with cobblestones, but these are obviously from our own coast. I have examined them during the last few days, selecting different points, and the following is the average per cent. of the rocks represented, clearly indicating that the sources of the cobblestones in the few pavements remaining was the Holderness coast or central Holderness gravel pits:—

	Per cent.
Basalt	33
Quartzite and hard sandstone	21
Carboniferous limestone	13
Pink granites	10
Quartz porphyries	5
Cheviot porphyrite	4
White granite	4
Lias limestone	3
Magnesian limestone	3
Rhomb-porphry	2
Lidianstone	1
Gneiss	1

T.S.

NORTHERN NEWS.

Mr. H. B. Booth's Presidential Address to the Yorkshire Naturalists' Union will be entitled 'The Migration of the Common Swallow.'

At the recent 'wireless concert' at the Hotel Cecil, referred to elsewhere, Viscount Grey, in proposing 'The Success of the Bird Sanctuary,' said he had occasionally bored his friends by talking about birds. 'I have one friend who, after I had been talking for some time on the subject of waterfowl, said that ducks should only be talked about when they are cooked.'

We are agreeably surprised to find that Messrs. Wheldon and Wesley are issuing a second edition of 'A Synopsis of the Accipitres (Diurnal Birds of Prey), part 1 of which has recently appeared 'revised and corrected throughout.' The first edition of part 1 was published in 1919 and contained 38 pages; the new part, covering the same species, contains 63 pages. It is sold at 6/-.

Some time ago Mr. Edward Lovett wrote a pamphlet on 'The Gun-Flint Industry of Brandon,' in which he described a very complete collection of the various tools used in connection with this old industry at Brandon, Suffolk, and of the various forms of flints, ancient and modern, forgeries, etc., emanating from that factory. This particular collection has just been purchased by the Museum at Hull.

Close upon the heels of part 20 of Barrett Hamilton's *History of British Mammals*, we have part 21 (Gurney and Jackson, 3/6 net). This contains descriptions of the squirrel and details of additions to the records in volume 2. The publication is well illustrated by sketches and diagrams, there are tables of measurements and so on, so that when complete, we feel sure that this work will be the finest of its kind on the particular subject dealt with.

'The Study of Human Implements as an aid to the appreciation of Principles of Evolution and Classification,' by E. J. Salisbury, is an interesting, if unexpected, contribution to *The New Phytologist* for November. The same journal contains 'A Study of Some Factors Controlling the Periodicity of Freshwater Algae in Nature,' by W. J. Hodgetts, and Thealassiphyta and the Algal Ancestry of the Higher Plants, by F. E. Fritsch.

'The Rambler's Guide to Bradford and Environs' (including 14 maps) has been published by 'Geographia' Ltd., at 1/3 net. The guide seems to have been written very carefully by someone thoroughly familiar with the districts covered, and there are many illustrations of interesting types of scenery, from photographs. We do not like the shape of the Guide, which is very difficult to accommodate on one's bookshelf, though it may be handy for the pocket.

T. V. Barker has issued 'Practical Suggestions towards the study of Crystals in Schools,' (14 pp., with interleaved blanks) which was issued in connection with the 'Science Masters' Association, Oxford Meeting,' recently. Mr. Barker deals with the subject from various points of view under 12 headings, the first four of which are:—(1) Apparatus. (2) Preparation of Solutions: General Technique. (3) Screen Projection for Class Purposes. (4) Formation of Crystals.

The Journal of the Marine Biological Association issued in September (price 5s. net) is a valuable contribution to Biological Science, and in addition to various abstracts, contains the following memoirs:—'The Larvæ of the Decapoda Macrura and Anomura of Plymouth,' by G. E. Webb; 'The Larval and Post-Larval Stages of the Pilchard, Sprat and Herring from Plymouth District' and 'The Food of Young Clupeoids,' by M. V. Lebour; 'A Contribution to our Knowledge of the Life-Histories of the Dog-fishes landed at Plymouth,' by E. Ford; 'Intersexes in *Gammarus chevreuxi* and Related Forms,' by E. W. Sexton and J. S. Huxley; 'Note on the Occurrence of *Arthopyrenia foveolata* at Plymouth,' by L. Batten. A large proportion of this useful work has been accomplished by women.

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It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators ; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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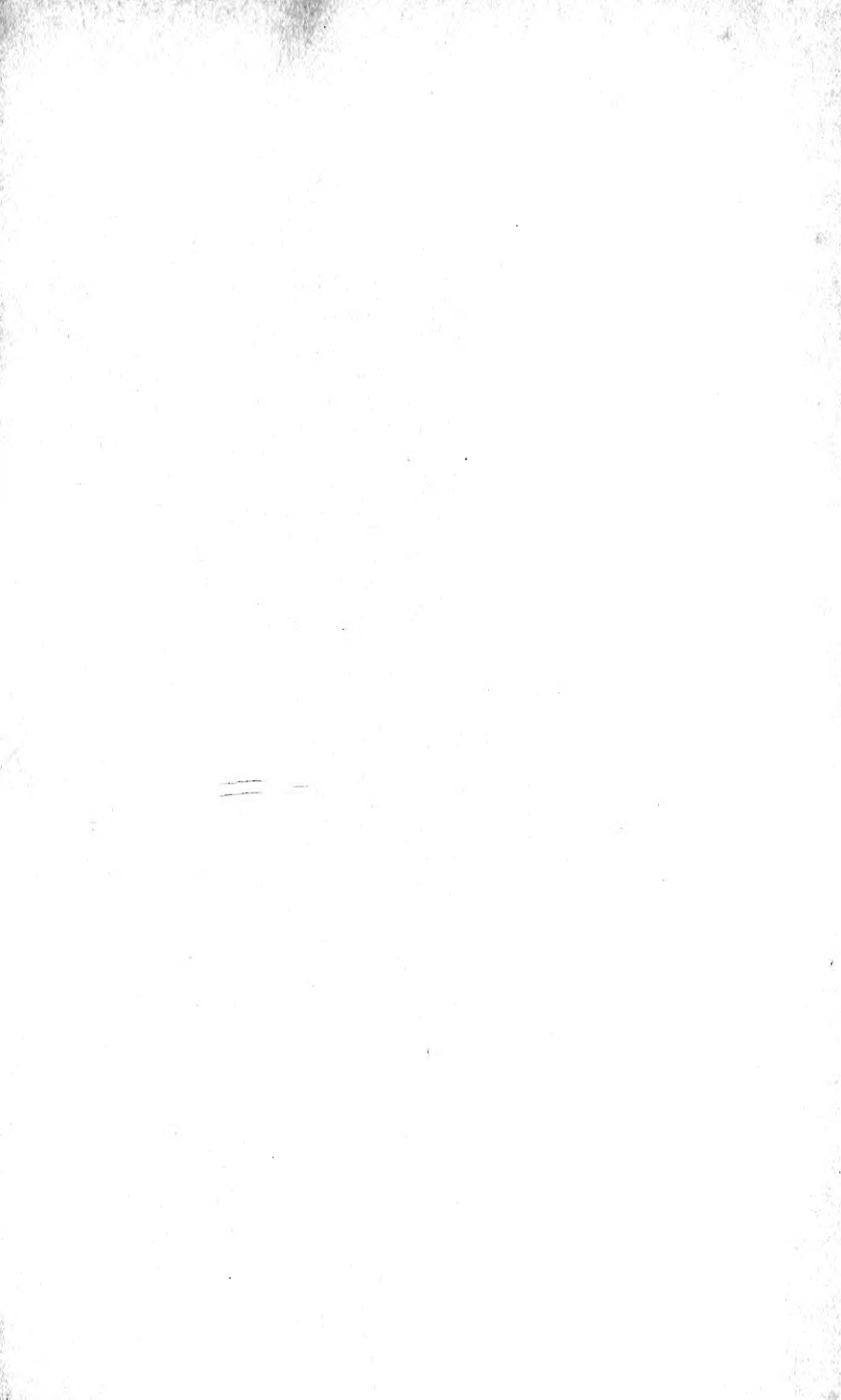
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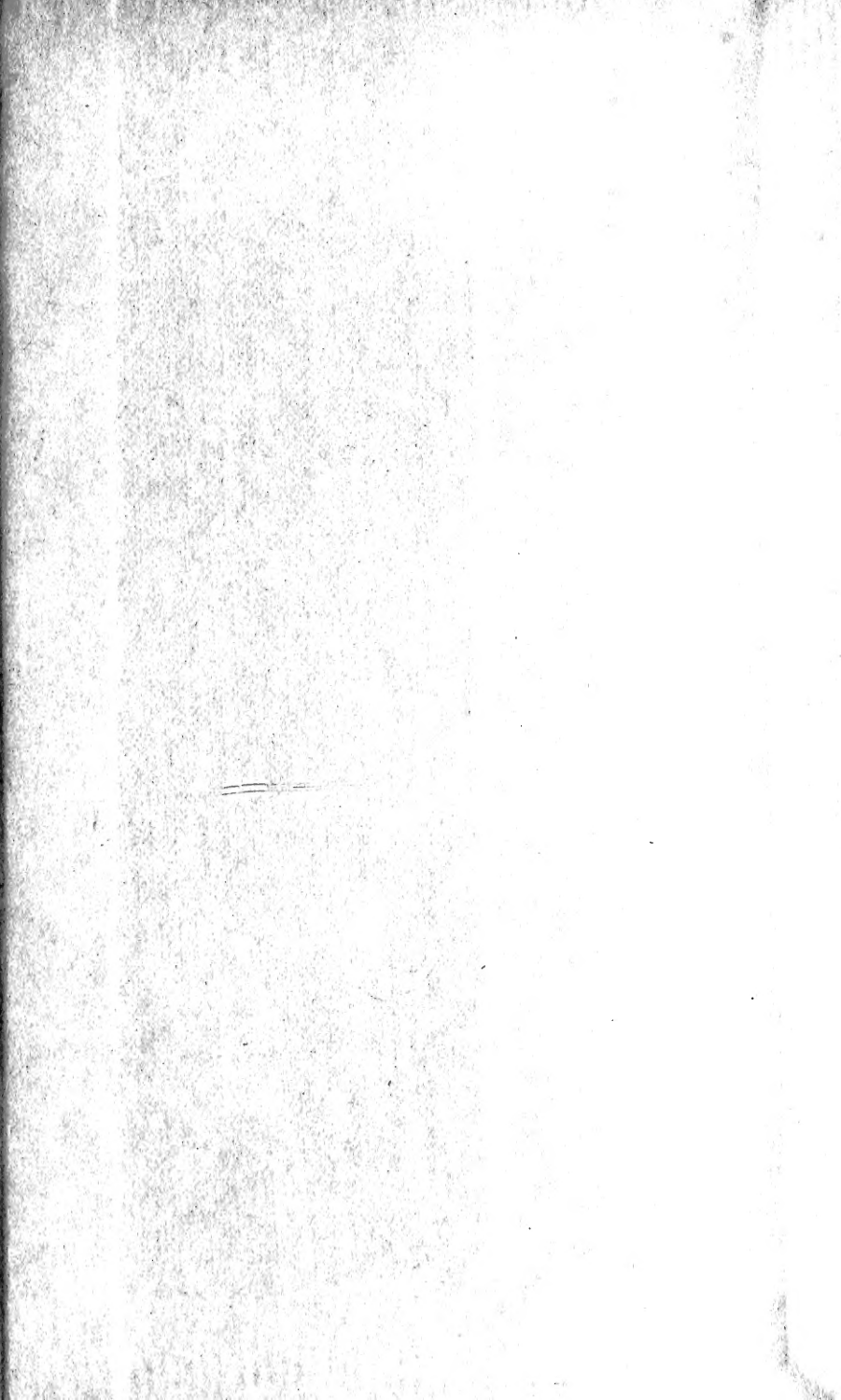
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